Intel® Server System S7000FC4UR Product Guide

A Guide for Technically Qualified Assemblers of Intel® Identified Subassemblies/Products

Intel Order Number D93989-002

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Intel server boards contain a number of high-density VLSI and power delivery components that need adequate airflow for cooling. Intel's own chassis are designed and tested to meet the intended thermal requirements of these components when the fully integrated system is used together. It is the responsibility of the system integrator that chooses not to use Intel developed server building blocks to consult vendor datasheets and operating parameters to determine the amount of airflow required for their specific application and environmental conditions. Intel Corporation can not be held responsible if components fail or the server board does not operate correctly when used outside any of their published operating or non-operating limits.

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Safety Information

Important Safety Instructions

Read all caution and safety statements in this document before performing any of the instructions. See also Intel Server Boards and Server Chassis Safety Information on the *Intel® Server Deployment Toolkit CD 2* and/or at http://support.intel.com/support/motherboards/server/sb/cs-010770.htm.

Wichtige Sicherheitshinweise

Lesen Sie zunächst sämtliche Warnund Sicherheitshinweise in diesem Dokument, bevor Sie eine der Anweisungen ausführen. Beachten Sie hierzu auch die Sicherheitshinweise zu Intel-Serverplatinen und Servergehäusen auf der *Intel® Server Deployment Toolkit CD 2* oder unter http://support.intel.com/support/motherboards/server/sb/cs-010770.htm.

Consignes de sécurité

Lisez attention toutes les consignes de sécurité et les mises en garde indiquées dans ce document avant de suivre toute instruction. Consultez Intel Server Boards and Server Chassis Safety Information sur le *Intel® Server Deployment Toolkit CD 2* ou bien rendez-vous sur le site http://support.intel.com/support/motherboards/server/sb/cs-010770.htm.

Instrucciones de seguridad importantes

Lea todas las declaraciones de seguridad y precaución de este documento antes de realizar cualquiera de las instrucciones. Vea Intel Server Boards and Server Chassis Safety Information en el *Intel® Server Deployment Toolkit CD 2* y/o en http://support.intel.com/support/motherboards/server/sb/cs-010770.htm.

重要安全指导

在执行任何指令之前，请阅读本文档中的所有注意事项及安全声明。 和/或 http://support.intel.com/support/motherboards/server/sb/cs-010770.htm 上的 Intel Server Boards and Server Chassis Safety Information（《Intel 服务器主板与服务器机箱安全信息》）。

Warnings

Heed safety instructions: Before working with your server product, whether you are using this guide or any other resource as a reference, pay close attention to the safety instructions. You must adhere to the assembly instructions in this guide to ensure and maintain compliance with existing product certifications and approvals. Use only the described, regulated components specified in this guide. Use of other products / components will void the UL listing and other regulatory approvals of the product and will most likely result in noncompliance with product regulations in the region(s) in which the product is sold.

System power on/off: The power button DOES NOT turn off the system AC power. To remove power from system, you must unplug the AC power cord from the wall outlet. Make sure the AC power cord is unplugged before you open the chassis, add, or remove any components.

Hazardous conditions, devices and cables: Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the server and disconnect the power cord, telecommunications systems, networks, and modems attached to the server before opening it. Otherwise, personal injury or equipment damage can result.

Electrostatic discharge (ESD) and ESD protection: ESD can damage drives, boards, and other parts. We recommend that you perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground any unpainted metal surface on your server when handling parts.

ESD and handling boards: Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges. After removing a board from its protective wrapper or from the server, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

Installing or removing jumpers: A jumper is a small plastic encased conductor that slips over two jumper pins. Some jumpers have a small tab on top that you can grip with your fingertips or with a pair of fine needle nosed pliers. If your jumpers do not have such a tab, take care when using needle nosed pliers to remove or install a jumper; grip the narrow sides of the jumper with the pliers, never the wide sides. Gripping the wide sides can damage the contacts inside the jumper, causing intermittent problems with the function controlled by that jumper. Take care to grip with, but not squeeze, the pliers or other tool you use to remove a jumper, or you may bend or break the pins on the board.

Preface

About this Manual

Thank you for purchasing and using the Intel® Server System S7000FC4UR.

This manual is written for system technicians who are responsible for troubleshooting, upgrading, and repairing this server chassis. This document provides a brief overview of the features of the chassis, a list of accessories or other components you may need, troubleshooting information, and instructions on how to add and replace components on the Intel® Server System S7000FC4UR Product Guide. For the latest version of this manual, see http://support.intel.com/support/motherboards/server/S7000FC4UR/.

Manual Organization

- Chapter 1 provides an overview of the Server System S7000FC4UR. In this chapter, you will find a list of the server board and chassis features, and product diagrams to help you identify components and their locations.
- Chapter 2 describes how to start up and shut down the server.
- Chapter 3 describes the *Intel® Server System S7000FC4UR Deployment Toolkit* CD.
- Chapter 4 provides instructions for using the utilities that are shipped with the server system or that you might need to download to update the system. This includes how to navigate through the BIOS Setup screens, how to perform BIOS and firmware updates, and how to configure the server management features.
- Chapter 5 provides instructions for adding and replacing hot-swappable and user-serviceable system components and memory DIMMs. You do not need a service technician to perform these tasks.
- Chapter 6 provides instructions for adding and replacing processors, memory, boards, and other components that require a certified service technician.

At the back of this book, you will find POST code information, safety and regulatory information, “getting help” information, and the warranty.

Additional Information and Software

If you need more information about this product or information about the accessories that can be used with this server chassis, use the following resources. These files are available at http://support.intel.com/support/motherboards/server/S7000FC4UR/

Unless otherwise indicated in the table below, once on this Web page, type the document or software name in the search field at the left side of the screen and select the option to search "This Product."

Table 1. Additional Information and Software

For this information or software	Use this Document or Software
For in-depth technical information about this product, including BIOS settings and chipset information	*Intel® Server System S7000FC4UR Technical Product Specification*
If you just received this product and need to install it	*Intel® Server System S7000FC4UR Quick Start User's Guide* in the product box
Accessories or other Intel server products	Spares and Configuration Guide
Hardware (peripheral boards, adapter cards) and operating systems that have been tested with this product	Tested Hardware Operating Systems List
Processors that have been tested with this product	Supported Processors
DIMMs that have been tested with this product	Supported Memory
To make sure your system falls within the allowed power budget	Power Budget
For diagnostics test software	Platform Confidence Tests (PCT)
For drivers	Driver (for an extensive list of drivers available) Operating System Driver (for operating system drivers)
For firmware and BIOS updates	Firmware Update
For software to manage your Intel® server	Intel System Management Software

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1 System Description

The Intel® Server System S7000FC4UR is a compact, high-density, 4U rack-mount system with support for one to four Intel® Xeon® processors MP and 256 GB of DDR2 533 MHz / 667 MHz FBDIMM memory. The system supports:

- Hot-plug PCI Express* add-in cards
- Hot-swap, redundant power supply modules
- Hot-swap, redundant cooling fans
- Memory with RAS features
- Hot-swap hard drives

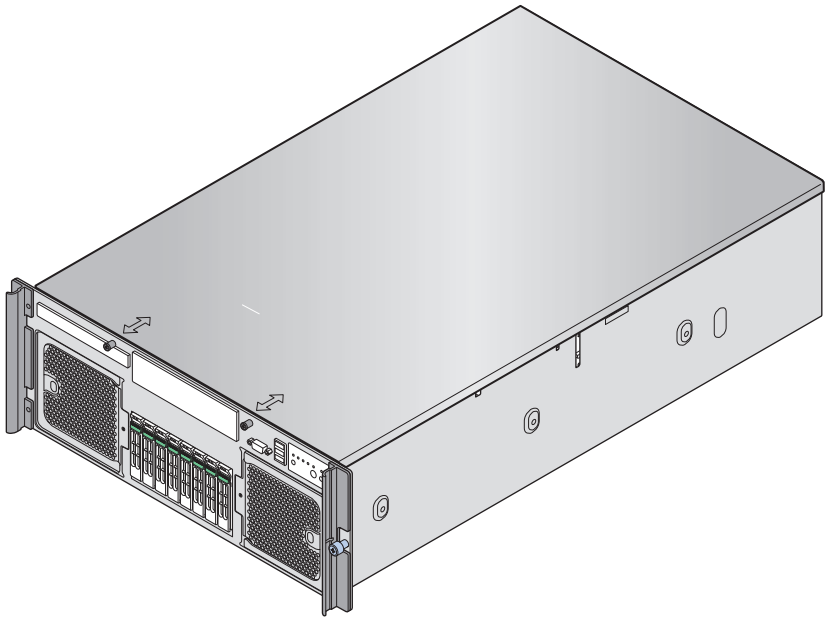


Figure 1. Intel® Server System S7000FC4UR

System Features

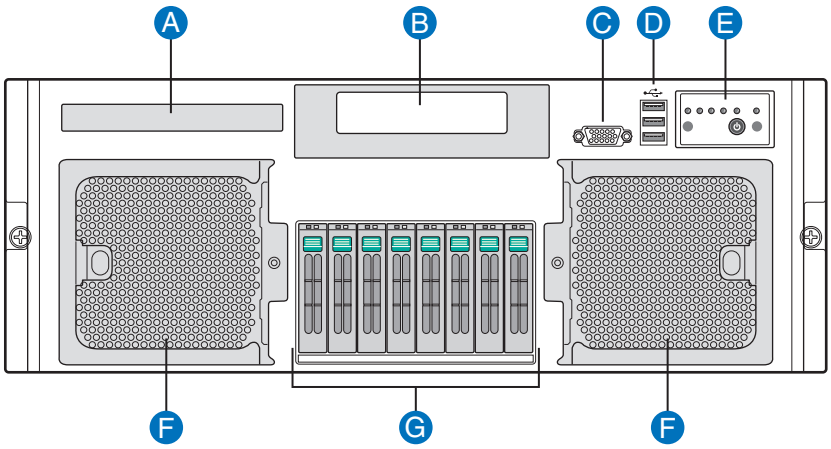
Table 2. Chassis Features

Feature	Description
Dimensions	Height: 6.8 inches (173 mm) Width: 17.6 inches (447 mm) Depth: 27.8 inches (706 mm) Weight of fully configured system: 90 lbs (40 kg)
Clearance requirements	Front clearance: 3 inches (76 mm) Side clearance: 1 inch (25 mm) Rear clearance: 6 inches (152 mm)
Configuration flexibility / scaleability	Support for one to four processors Support for at least two generations of processors Support for up to four 2.5-inch SATA hard drives, or eight 2.5-inch SAS hard drives with optional SAS riser board Support for up to seven PCI-Express* adapters: • Four x8 slots • Three x4 slots Support for up to 256 GB Fully Buffered DIMM (FBD) Double Data Rate-2 (DDR2) 533 or 667 MHz memory Support for two integrated gigabit LAN ports, or four integrated gigabit LAN ports with optional I/O riser board The optional Intel® Local Control Panel provides an LCD display that allows you to configure and monitor the health of the server independently from the operating system
Serviceability	Front access to hot-swap hard drives Front access to hot-swap fans Rear access to hot-swap power supplies System power and system status LEDs System ID buttons and LEDs on front panel and rear of system Memory status LEDs Processor failure LEDs Color-coded parts to identify hot-swap and non-hot-swap serviceable components

Table 2. Chassis Features

Feature	Description
Availability	Two hot-plug PCI Express* slots. Up to two 1570-watt power supplies in a redundant (1+1) configuration. The second power supply is optional. Dual power cords (1+1) when two power supplies are installed. Up to eight hot-swap system fans in a redundant (7+1) configuration. Two rear fans are optional; four rear fans are required for redundancy. Eight hot-swap 2.5-inch SAS hard drives. SAS RAID riser board (optional) with a battery-backed DDR2 DIMM for disk cache.
Manageability	Remote management Emergency Management Port (EMP) Intelligent Platform Management Interface (IPMI) 1.5 compliant, partial IPMI 2.0 compliance Wired For Management (WfM) 2.0 compliant Remote diagnostics support Optional Intel® Remote Management Module 2 provides remote KVM and media features (requires optional I/O riser)
Front control panel	System power button and LED System reset button NMI button System ID button and LED Optional Intel® Local Control Panel System status LED Hard drive status LED LAN1 and LAN2 status LEDs Video connector Three USB 2.0 ports

System Front



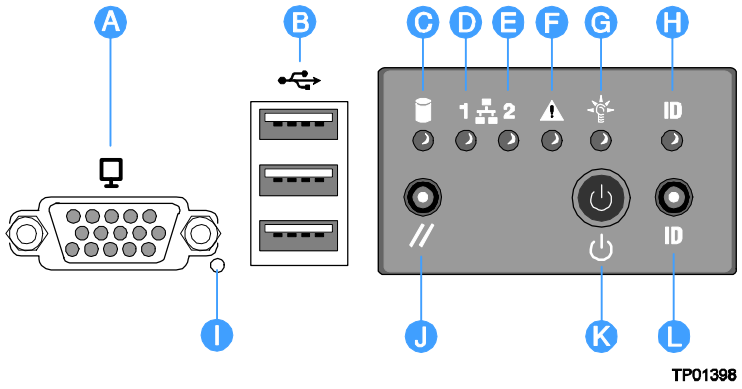
Item	Description
A	CD-ROM / DVD-ROM drive bay
B	5 ¼-inch peripheral bay
C	Video connector
D	USB 2.0 ports
E	Front control panel. Standard control panel shown.
F	Hot-swap fan modules (2)
G	Hot-swap hard drives (8)

Figure 2. Front Components

Front Control Panel

You can choose between the standard control panel or the Intel® Local Control Panel to monitor and control your system locally.

The standard control panel provides the following user interface for system management and status LEDs.

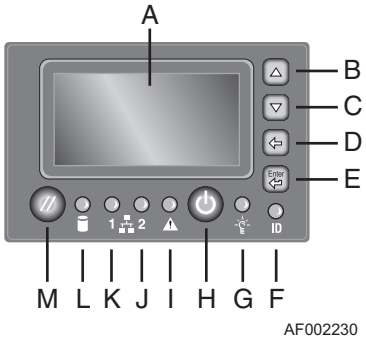


Item	Feature	Description	
Front Panel Connectors			
A	Video connector	Standard VGA-compatible video port	
B	Three USB connectors	2.0 port, 4-pin connectors	
Front Panel Buttons and LED Indicators			
C	Hard drive activity LED	Green / amber LED that indicates hard drive activity and faults	
		LED State	**Drive State**
		Green on	SAS drives are installed and functioning correctly **NOTE:** LED may blink if all drives are active at the same time.
		Green blink	SATA drives are installed and active
		Amber on	Drive / slot failure
		Amber slow blink (~1 Hz)	Predictive hard drive / slot failure or rebuild in process
		Amber fast blink (~2.5 Hz)	Rebuild interrupted or rebuild on empty slot

Item	Feature	Description		
D E	LAN1, LAN 2 Status LEDs	Green LEDs LAN1 shows status of either LAN port on the server board LAN2 shows status of either LAN poor on the I/O riser board		
		LED State	**LAN State**	**Activity**
		Off	Idle	No activity
		Blinking	Active	Access
F	System status / fault LED	Green / amber LED for system status. See Table 3 for additional details.		
		LED	**System State**	**Definition**
		Off	Not ready	AC power off
		Green on	Ok	System is booted and ready to operate
		Green blink	Degraded	System is in a degraded state
		Amber blink	Non-fatal	System is likely to fail
		Amber on	Fatal	System has failed
G	System power LED	Green LED for system power status		
		LED State	**System Power State**	**ACPI**
		Off	Power off	No
		On	Power on	No
		Off	S4 / S5	Yes
		Blink	S1	Yes
		On	S0	Yes
H	System ID LED	Blue ID that identifies the system through server management or locally		
I	NMI button	Asserts NMI		
J	System reset button	Press to reset the system		
K	System power button	Press to turn the system power on or off		
L	System ID button	Press to turn the system ID LED on or off		

Figure 3. Front Panel Controls and Indicators

The optional Intel® Local Control Panel provides the following user interface for system management and status LEDs.



Item	Feature	Description		
A	LCD display	Video display		
B	Scroll up button	Press to scroll up on the LCD		
C	Scroll down button	Press to scroll down on the LCD		
D	Back button	Press to move to the previous screen		
E	Select button	Press to enter a command or select an option		
F	System ID LED	Blue LED to identify the system through server management software		
G	System power LED	Green LED to show system status		
		LED State	**System Power State**	**ACPI**
		Off	Power off	No
		On	Power on	No
		Off	S4 / S5	Yes
		Blink	S1	Yes
		On	S0	Yes
H	System power button	Toggles system power on and off		

<table>
<tr><th>Item</th><th>Feature</th><th colspan="3">Description</th></tr>
<tr><td>I</td><td>System status / fault LED</td><td colspan="3">Green / amber LED for system status. See Table 3 for additional details.</td></tr>
<tr><td></td><td></td><td>LED</td><td>System State</td><td>Definition</td></tr>
<tr><td></td><td></td><td>Off</td><td>Not ready</td><td>AC power off</td></tr>
<tr><td></td><td></td><td>Green on</td><td>Ok</td><td>System is booted and ready to operate</td></tr>
<tr><td></td><td></td><td>Green blink</td><td>Degraded</td><td>System is in a degraded state</td></tr>
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<tr><td>J
K</td><td>LAN1, LAN 2 Status LEDs</td><td colspan="3">Green LEDs
LAN1 shows status of either LAN port on the server board
LAN2 shows status of either LAN poor on the I/O riser board</td></tr>
<tr><td></td><td></td><td>LED State</td><td>LAN State</td><td>Activity</td></tr>
<tr><td></td><td></td><td>Off</td><td>Idle</td><td>No activity</td></tr>
<tr><td></td><td></td><td>Blinking</td><td>Active</td><td>Access</td></tr>
<tr><td>L</td><td>Hard drive status LED</td><td colspan="3">Green / amber LED that indicates hard drive activity and faults</td></tr>
<tr><td></td><td></td><td>LED State</td><td colspan="2">Drive State</td></tr>
<tr><td></td><td></td><td>Green on</td><td colspan="2">SAS drives are installed and functioning correctly
NOTE: LED may blink if all drives are active at the same time.</td></tr>
<tr><td></td><td></td><td>Green blink</td><td colspan="2">SATA drives are installed and active</td></tr>
<tr><td></td><td></td><td>Amber on</td><td colspan="2">Drive / slot failure</td></tr>
<tr><td></td><td></td><td>Amber slow blink (~1 Hz)</td><td colspan="2">Predictive hard drive / slot failure or rebuild in process</td></tr>
<tr><td></td><td></td><td>Amber fast blink (~2.5 Hz)</td><td colspan="2">Rebuild interrupted or rebuild on empty slot</td></tr>
<tr><td>M</td><td>System reset button</td><td colspan="3">Resets the system</td></tr>
</table>

Figure 4. Intel® Local Control Panel

Both the standard and Intel® Local Control Panel provide the same Status LED information:

Table 3. System Status LED States

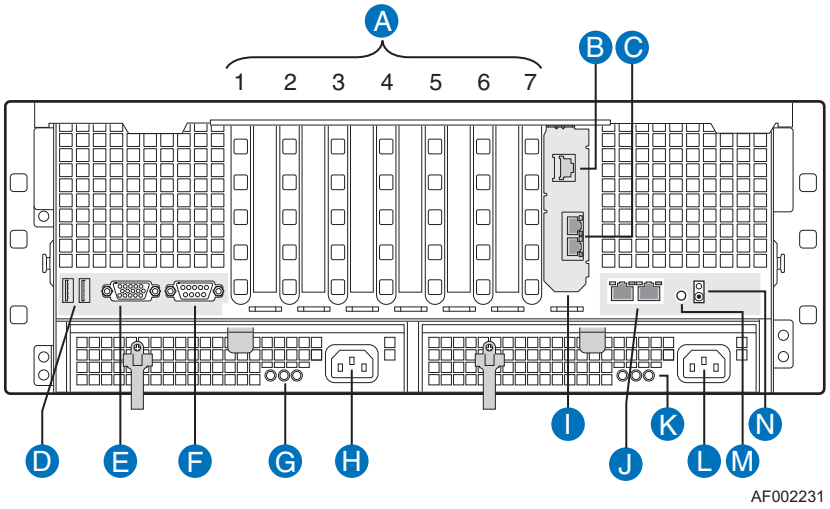
LED Color	LED State	System Status	Description
Off	N/A	Not ready	The AC power is off
Green	On	OK	System is ready to operate
Green	Blink	Degraded	The system is in a degraded state because of: • Unable to use all of the installed memory when more than one DIMM is installed • More than 10 correctable memory errors occurred and data is migrating to a spare DIMM (memory sparing or mirroring is enabled) • Loss of system memory redundancy (memory sparing or mirroring is enabled) • PCI Express* correctable link errors • Loss of power supply or fan redundancy • Processor disabled • Non-critical threshold crossed (temperature, voltage, power nozzle, power gauge, PROCHOT1) • Battery failed
Amber	Blink	Non-fatal	Non-fatal alarm. The system is likely to fail because of: • More than 10 correctable memory errors occurred and in a non-redundant memory configuration • PCI Express uncorrectable link errors • Critical threshold crossed (temperature, PROCHOT) • VRD hot-asserted • Minimum number of fans not present or too many fans failed

Table 3. System Status LED States

LED Color	LED State	System Status	Description
Amber	On	Fatal	Fatal alarm. The system has failed or shut down because of: • DIMM failure with only one DIMM present / no good memory present. • Run-time memory uncorrectable error in non-redundant memory mode. • CPU IERR signal asserted. • No processor present or processor configuration errors • CPU THERMTRIP • No power good / power fault • Power unit redundancy sensor. Insufficient resources offset. Not enough power supplies present

System Rear

This diagram shows the system with the optional I/O panel installed.



Item	Description	
A	PCI slots	
	Slot 1	PCI Express* x8, hot-plug
	Slot 2	PCI Express* x8, hot-plug
	Slot 3	PCI Express* x8, not hot-plug
	Slot 4	PCI Express* x8, not hot-plug
	Slot 5	PCI Express* x4, not hot-plug
	Slot 6	PCI Express* x4, not hot-plug
	Slot 7	PCI Express* x4, not hot-plug
B	Intel® Remote Management Module 2 (Intel® RMM2) NIC	
C	I/O riser Ethernet ports (two)	
D	USB ports (two)	
E	Standard VGA-compatible video port with 15-pin connector	
F	Serial port B connector	
G	Power supply LEDs	
	Power Supply LED	**Power Supply Status**
	Left: Power good (green)	Power supply is on
	Center: Fault (amber)	Power supply failure
	Right: AC OK (green)	Power supply is connected to AC
H	AC input power connector	
I	I/O riser card (optional)	
J	LAN 1 (left), LAN 2 (right) RJ45 Ethernet connectors	
	LAN Port LED	**LAN Status**
	Status LED (green)	Off: No Ethernet connected On: Ethernet link detected Blink: Ethernet link active
	Speed LED (green / amber)	Off: 10 Mbps Green: 100 Mbps Amber: 1000 Mbps

Item	Description	
K	Power supply LEDs	
	Power Supply LED	**Power Supply Status**
	Left: Power good (green)	Power supply is on
	Center: Fault (amber)	Power supply failure
	Right: AC OK (green)	Power supply is connected to AC
L	AC input power connector	
M	System ID button	
N	Blue system ID LED to identify the system from among many systems	

Figure 5. System Rear

Processors

One to four 64-bit Intel® Xeon® processors MP are supported.

System Memory

The memory boards connect to the main board through x16 PCI Express* connectors. One to four memory boards can be installed, two on each side of the system. Memory board baffles are not needed for empty memory board slots, but DIMM blanks are required for each socket on each memory board in which a DIMM is not installed.

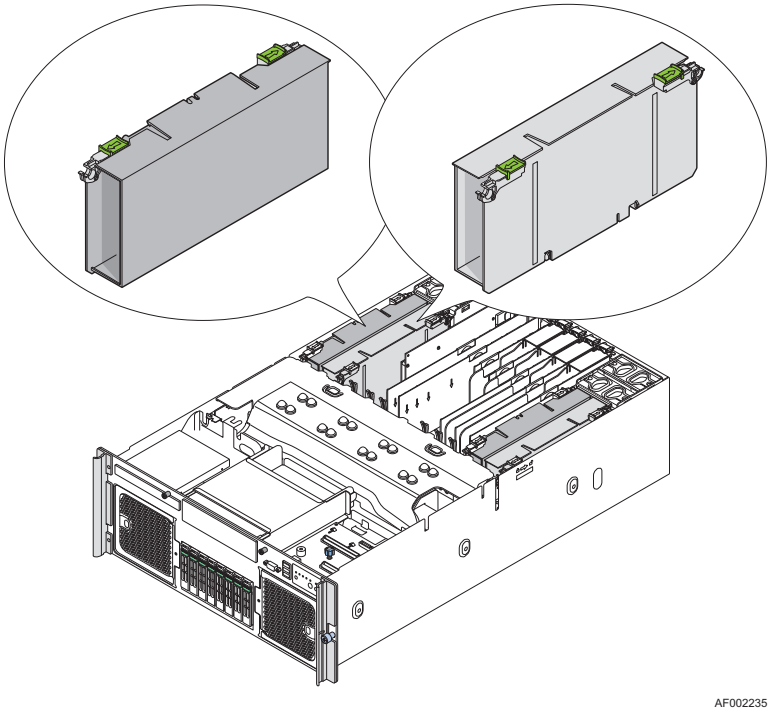


Figure 6. Memory Boards

Each memory board has these features:

- Supports up to eight FBD Generation-1 DIMMs
- Supports FBD speeds of 533MT/s (4-4-4, 5-5-5 latencies) and 667MT/s (5-5-5 latency)
- Supports FBDIMM configurations of x8, x4, single, dual-rank DDR2 DRAMs
- Supports DDR2 DRAM technologies of 512 Mbit, 1 Gbit, and 2 Gbit
- Supports Closed Loop Thermal Throttling with FBDIMM AMB temperature sensors
- LED fault indicators for each DIMM
- One field replaceable unit (FRU) EEPROM
- Supports memory mirroring and memory sparing

See "Memory Board" on page 28 for additional information.

Power Subsystem

The power subsystem consists of:

- Power supply modules (see below)
- Power distribution board (see "Power Distribution Board" on page 35)

1+1 power supply redundancy or operation with a single power supply is supported under all configurations at 220 VAC. At 100 or 115 VAC, 1+1 power supply redundancy or operation with only one power supply is supported only if the power supply DC limits are not exceeded.

If your desired configuration exceeds the power supply limits, two power supplies are required. The two power supplies will operate in current-sharing mode to deliver the additional power needed for your configuration. The two power supplies must be sourced from separate AC circuits so they do not exceed maximum AC inlet current. Exceeding the maximum AC inlet current may cause a circuit breaker to trip.

In a redundant configuration, the system supports one fault at a time, either one fan fault or one power supply fault, and it supports hot-swapping one component at a time.

Power Supply Modules

The output rating of each power supply is 1570 watts when operated between 180 VAC and 264 VAC. It is current-sharing with auto-ranging input. The power supply is 7.75 inches wide, 14.5 inches deep, and 1.47 inches high. The power supply modules have universal AC input with Power Factor Correction (PFC) Distributed Power Supplies (DPS). The AC input receptacle is an IEC-320 C14.

The power supply has DC outputs of 12 V and 3.3 VSB. The 12 V main power is distributed through the server and is converted locally at the point-of-load using embedded VRM converters. The power supply is capable of power-safe monitoring.

The maximum AC input current is:

- 100 - 127 VAC: 12 A
- 200 - 240 VAC: 7 A

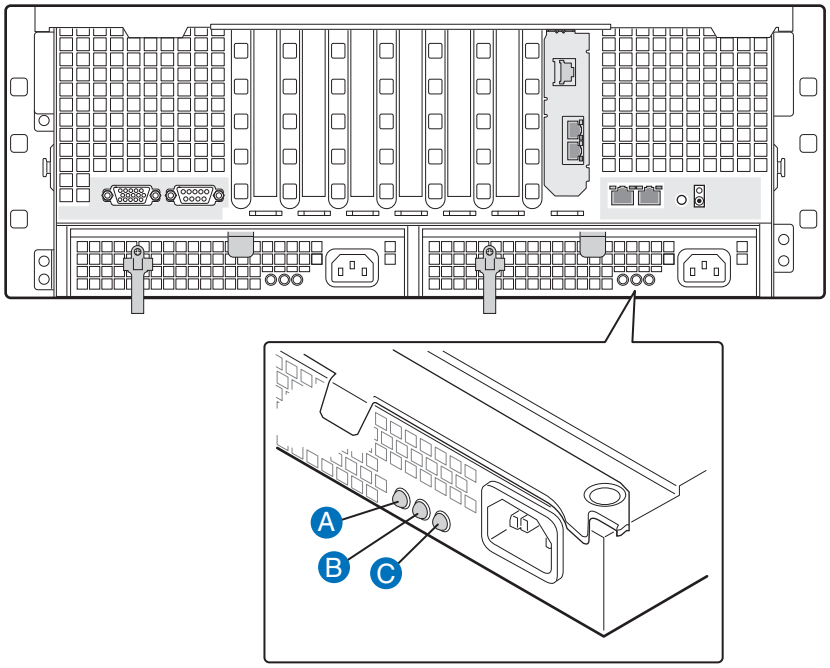
The maximum input current listed is the maximum AC inlet current that can be drawn by the power supply / supplies. If two power supplies are installed, then this value is the maximum combined input current for both AC inlets.

In an N+1 configuration, the 12 VDC outputs have active (forced) current-sharing. The two externally enabled outputs have these maximum ratings:

- +12 VDC: 121 A
- +3.3 VDCSB: 5 A

Each power supply module requires one power cord to supply AC power to the system. One power supply ships with the standard system. When two power supply modules and two power cords are installed, the system supports (1+1) power cord redundancy. This allows the system to be powered by two separate AC sources. In the 1+1 configuration, the system continues to operate without interruption if one of the AC power sources fails.

Each power supply module has three status LEDs next to the input connector.



LED Location	Purpose	Description
A (left)	Power Good LED (green)	This green LED is driven by internal circuitry and is lit whenever the power is turned on.
B (center)	Fault LED (amber)	This amber LED is driven by internal circuitry and is lit when a power rail has failed. The LED is lit even if the power supply is in a latched state. The only time (during a fault) when it is not lit is if the +3.3VSB is lost. The LED is not lit when the power supply is turned off by powering down the system.
C (right)	AC OK LED (green)	This green LED is driven by internal circuitry and is lit whenever the AC power cord is plugged in to an active AC power source.

Figure 7. Power Supply Indicators

Note: *The cooling system is non-redundant if only one power supply is installed.*

Caution: *Power supplies must be hot-swapped within two minutes. This time period applies only to the time that the power supply is physically removed, not from the time of failure.*

Power Supply Consumption

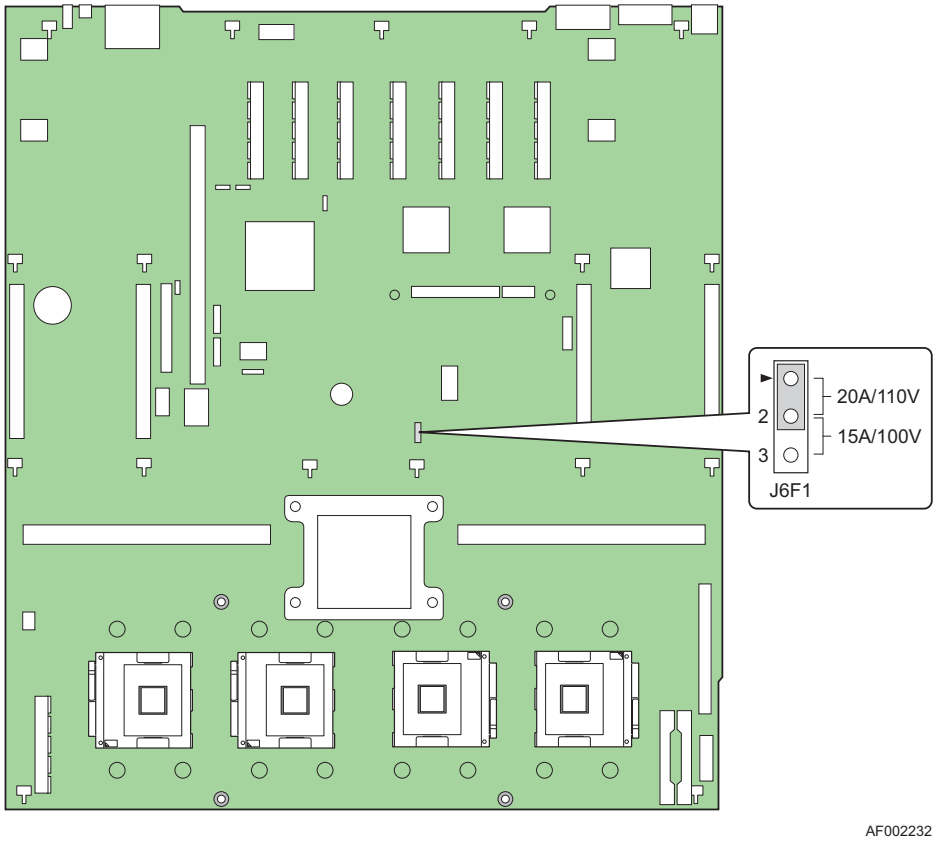


Figure 8. Power Consumption Selection Jumper

Jumper J6F1 is used to set a threshold for power consumption when operating the server with a single power supply on a low-line 100 / 110 / 115 / 120 / 127 VAC power circuit. This threshold ensures the power consumption of the server does not exceed the power that can be supplied by a single AC power circuit. When the system has two power supplies, a separate AC power circuit is needed for each power supply to guarantee the AC power circuit capability is not exceeded.

When a server is connected to low-line power, the J6F1 jumper sets these power consumption thresholds:

- Pins 1-2 covered: Sets the power consumption threshold to 1180 watts

- Pins 2-3 covered: Sets the power consumption threshold to 1030 watts

Power consumption is based on the power consumed within the system. Power factors for inefficiency are not included in the above figures.

Servers connected to high-line power (200 / 208 / 220 / 230 / 240 VAC) do not have a power consumption threshold. Under these conditions, jumper J6F1 should be set to:

- 100 / 110 VAC rated circuit: cover pins 2-3
- 115 / 120 / 127 VAC rated circuit: cover pins 1-2
- 200 / 208 / 220 / 230 / 240 VAC rated circuit: cover pins 1-2

The power consumption threshold is most likely to be exceeded when all of the following conditions are met:

- The server is connected to a low-line power circuit
- The server has a single power supply installed
- The server is fully configured with four processors, 16 x4 GB DIMMs, and all PCI slots are filled
- The server is running at maximum performance

If the power consumption threshold is crossed, the hardware throttles the processors to reduce the power consumption to below the set threshold. The processor performance can be returned to the full performance level by power cycling the server.

When two power supplies are installed, the required power is divided between them. By using both circuits, the server can draw more power than the threshold limit for a single power supply.

The hardware reduces the amount of power consumed if one of the power supplies fails. This ensures the system consumes less power than the threshold from the single operating power supply. When a failed power supply is replaced, the system is again able to share the power load and operate at full performance.

If the J6F1 jumper is set incorrectly, the following may occur:

- If the jumper is covering pins 1-2 on a 100 / 110 VAC circuit, the server is allowed to consume up to 1180 watts. This setting may cause a circuit breaker to trip.
- If the jumper is covering pins 2-3 on a 115 / 120 / 127 VAC circuit, the server power consumption threshold is set to 1030 watts. The lower power threshold may be exceeded, limiting system performance.

Cooling Subsystem

Caution: *The chassis top cover must be installed for proper system cooling. Cooling components must be hot-swapped within two minutes. This time period applies only to the time that the cooling component is physically removed, not from the time of failure.*

The cooling subsystem consists of hot-swap, redundant (7+1) fans. In a redundant configuration, the system supports one fault at a time, either one fan fault or one power supply fault, and it supports hot-swapping one component at a time. If a cooling component fails, the system cooling is maintained and the system continues to operate while the component is hot-swapped.

Each front fan assembly has one status LED. The LED is off when both fans are operating normally. The LED illuminate amber if one or both of the fans fails. Failed front fans can be hot-swapped from the front of the system.

Each rear fan has one status LED. The LED is off when the fan is operating normally and illuminates amber if the fan fails. Failed rear fans can be replaced from the top of the system when the top cover is removed.

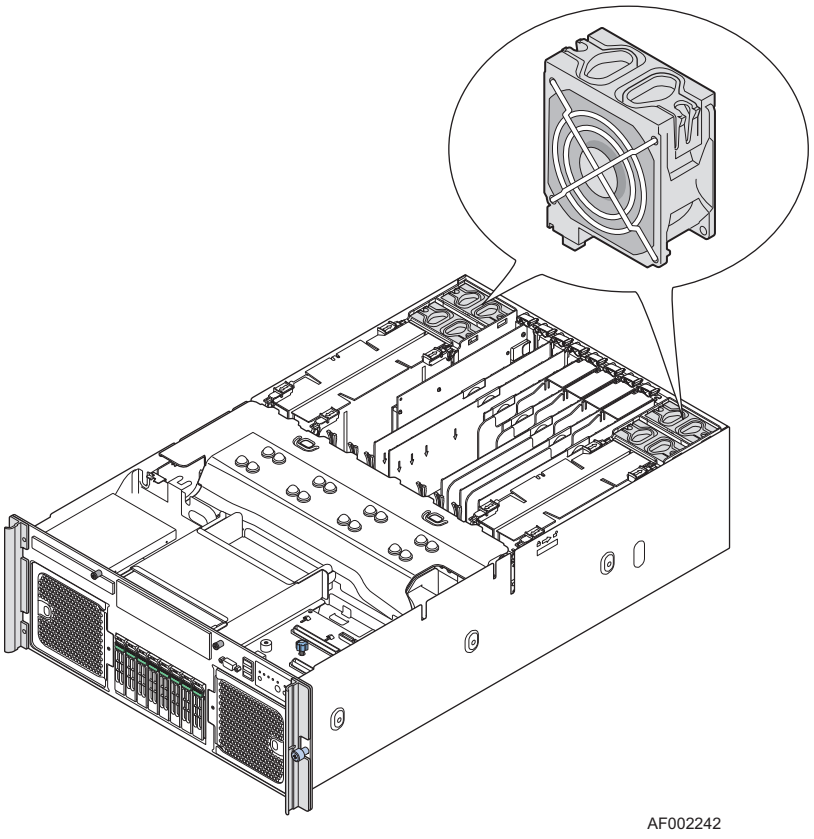


Figure 9. Rear Fan Locations

For proper processor cooling, the processor duct must always be in place. Systems that are configured with fewer than four processors should have processor blanks installed to maintain proper cooling.

Hot-swap PCI Slots

The two hot-swap PCI slots have power and attention LEDs. The attention button is used to invoke a hot-swap sequence to remove or add an adapter without using the software interface. The LEDs are identified by the green arrow on the PCI divider label.

Table 4. Hot-swap PCI Slot Power and Attention LED

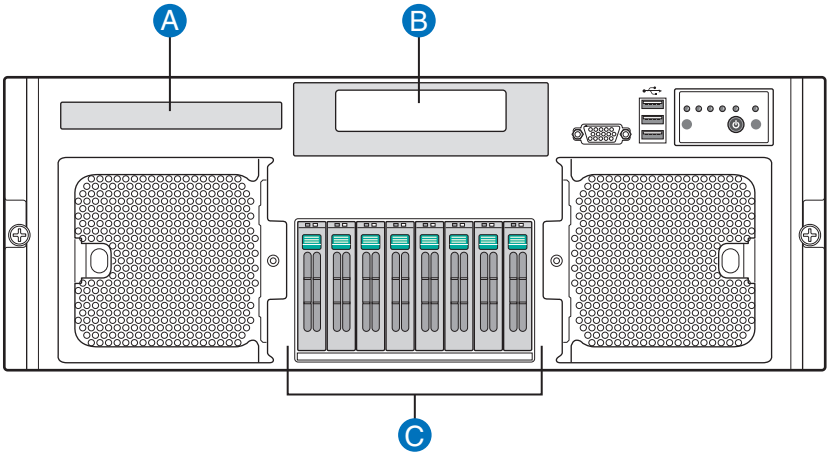
Green Power LED State	Definition
Off	Power off: Power has been removed from the slot. A card can be inserted or removed.
On	Power on: The slot is powered on. A card cannot be inserted or removed.
Blinking	Power transition: The slot is powering up or down. A card cannot be inserted or removed.
Amber Attention LED State	**Definition**
Off	Normal: Normal operation.
On	Attention: Power fault or operational problem has occurred with this slot.
Blinking	Locate: The slot is being identified.

Note: *If you hot-remove a PCI card without following the proper procedure, power is automatically be turned off to the slot.*

Peripherals

These peripheral devices are supported:

- Up to eight hot-swap 2.5-inch SAS hard drives or four 2.5-inch SATA hard drives
- One 1/2-inch IDE DVD-ROM / CD-ROM drive
- One 5 1/4-inch device bay

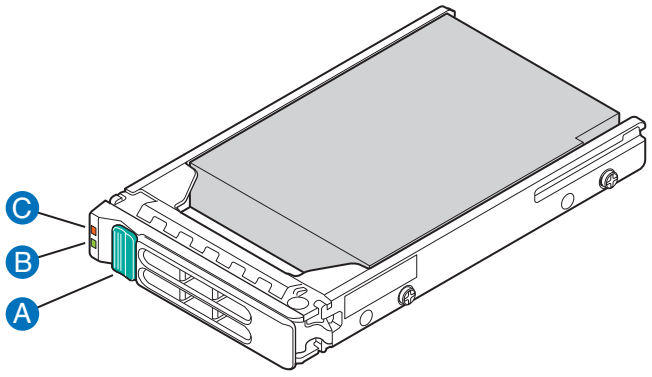


Item	Description
A	DVD-ROM / CD-ROM drive
B	Tape drive (optional)
C	Hard drives (eight)

Figure 10. Peripheral Area

Hot-Swap Hard Drive

The hot-swap hard drive carrier and SAS backplane board accommodate 2.5-inch SAS or SATA hard drives.



Item	Description	
A.	Latch	
B.	Green LED	
	Green on	SAS drive is installed and working correctly
	Green blink	Hard drive is active
C.	Amber LED	
	Amber on	Hard drive or slot failure
	Amber slow blink (~1 Hz)	Predictive hard drive / slot failure or rebuild is in process
	Amber fast blink (~2.5 Hz)	Hard drive rebuild interrupted or rebuild on empty slot

Figure 11. Hard Drive Carrier

Optical Drive Bay

The DVD-ROM / CD-ROM drive is installed in a sheet metal carrier that inserts from the front of the system. You must power down the system and remove the top cover to remove or install this device. A slimline IDE drive is supported if a SATA-to-IDE adapter board is used. This board is connected to the drive and cabled to an internal SATA port on the main board.

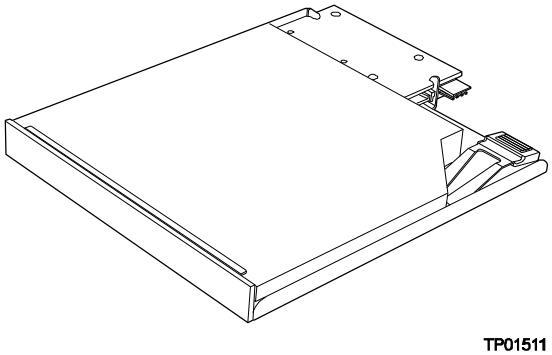


Figure 12. DVD-ROM / CD-ROM Drive Carrier

5 ¼-inch Half-height Drive Bay

The system supports one 5 ¼-inch, half-height device mounted at the front of the system. A USB or SATA tape backup device can be cabled to the internal USB or SATA port located on the main board. Alternatively, a SCSI or SAS tape backup device can be cabled to a PCI Express* add-in card (not included).

System Board Set

The board set consists of these boards:

- Main board
- Memory boards
- I/O riser board (optional)
- SAS riser board (optional)
- Front panel board
- SAS backplane board
- Power distribution board
- SATA-to-IDE adapter board

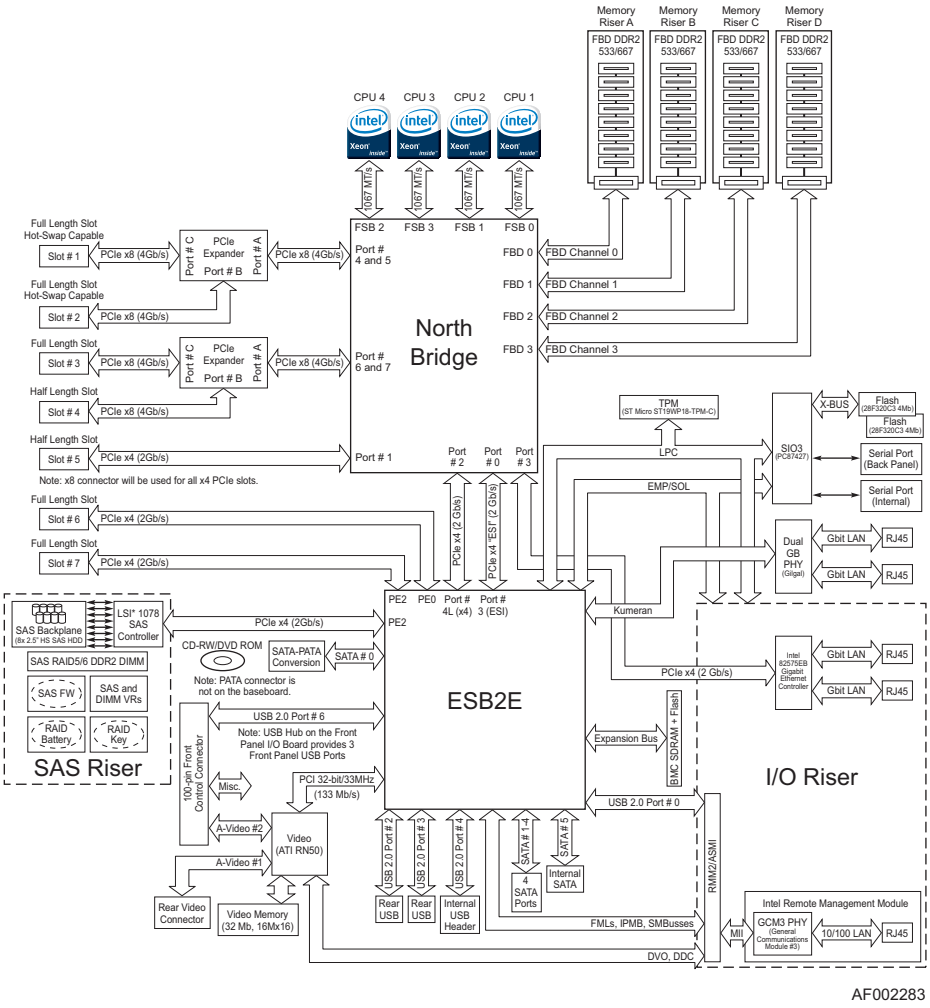


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Figure 13. Block Diagram

Main Board

The main board contains:

- Chipset north and south bridge components
- Processor sockets
- Four memory board connectors
- Video components
- Trusted Platform Module
- BIOS Flash components

- Super I/O*
- Seven PCI Express* slots
- Back panel I/O connectors
- Many voltage regulators used by the components
- Many of the primary voltage rails used by the rest of the board set

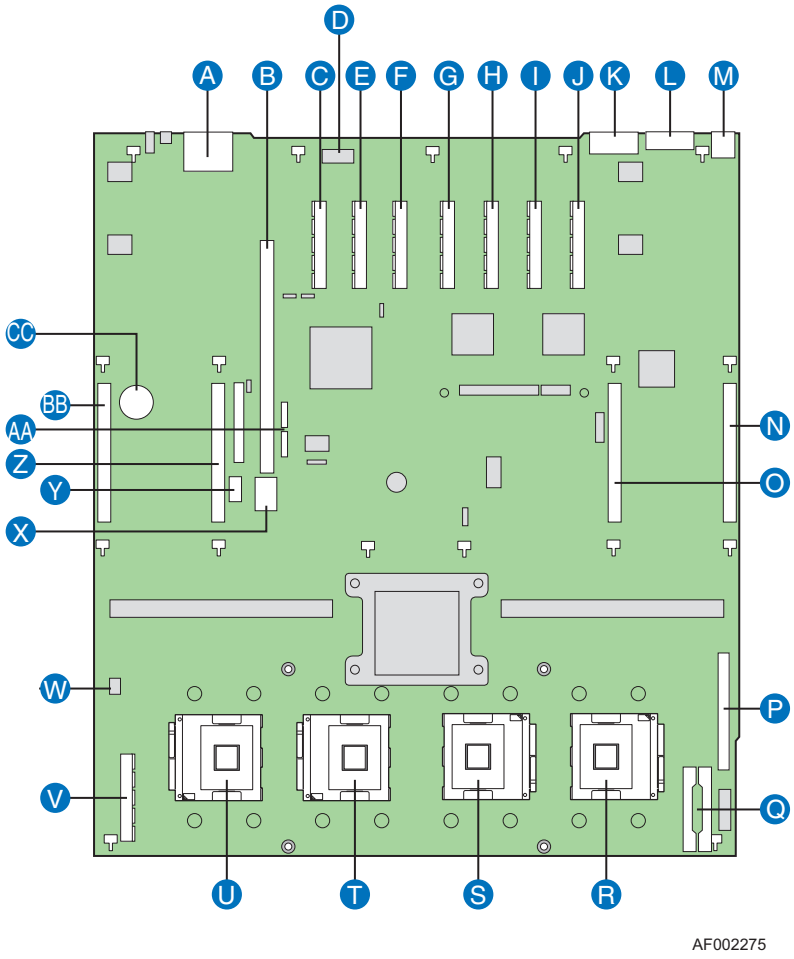

Figure 14. Main Board Component Locations

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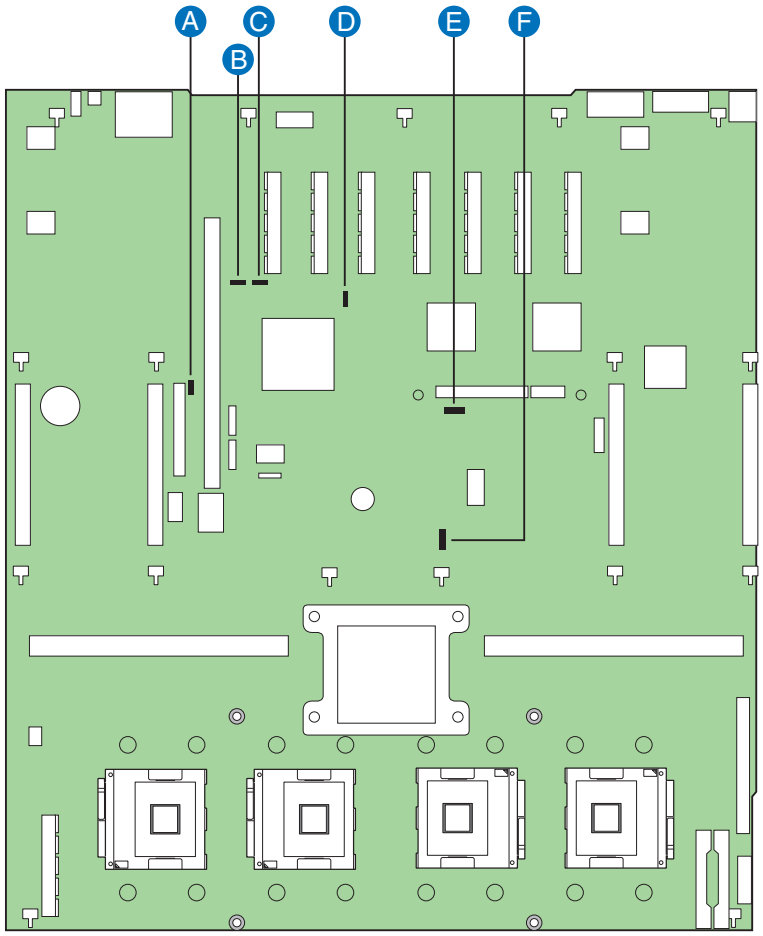
Item	Description	Item	Description
A	Dual Ethernet ports	P	Front panel connector
B	I/O riser slot	Q	Power distribution board connectors (3)
C	PCI Express* x4 (slot 7)	R	Processor socket 1
D	Serial Port A	S	Processor socket 2

Item	Description	Item	Description
E	PCI Express x4 (slot 6)	T	Processor socket 3
F	PCI Express x4 (slot 5)	U	Processor socket 4
G	PCI Express x8 (slot 4)	V	SAS riser slot
H	PCI Express x8 (slot 3)	W	Chassis intrusion
I	PCI Express x8 hot-plug (slot 2)	X	4-port SATA connector
J	PCI Express x8 hot-plug (slot 1)	Y	Internal USB port
K	Serial port B	Z	Memory board (slot C)
L	Video port	AA	Single port SATA connectors
M	USB 1 (top), USB 2 (bottom)	BB	Memory board (slot D)
N	Memory board (slot A)	CC	Real-time clock battery
O	Memory board (slot B)		



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Label	Name	Location	Default	Stuffed Jumper State
A	Rolling BIOS	J3D1	Empty Stuff	1 - 2 = Force other bank 2 - 3 = Normal mode
B	Password disable or clear	J3C2	Stuff Empty	1 - 2 = Password protect 2 - 3 = Password disabled / cleared
C	Clear CMOS / NVRAM	J3C3	Stuff Empty	1 - 2 = Normal 2 - 3 = Forced CMOS / NVRAM clear
D	BMC force update	J5C1	Stuff Empty	1 - 2 = Disable BMC force update 2 - 3 = Enable BMC force update
E	BMC flash write protect	J6D1	Stuff Empty	1 - 2 = Disable flash write protect 2 - 3 = Enable flash write protect

Label	Name	Location	Default	Stuffed Jumper State
F	Circuit breaker	J6F1	Empty Stuff	1 - 2 = 20A/110V (USA) 2 - 3 = 15A/100V (Japan)

Figure 15. Main Board Jumpers

SATA Device Support

The ESB2 provides six Serial ATA (SATA) ports with a transfer rate of up to 3.0GB/s. The main board has two internal, industry-standard 7-pin vertical SATA connectors that can be cabled directly to a SATA device.

As an alternative to using a SAS riser to support eight SAS hard drives, an internal x4 8086 SAS/SATA connector is provided to cable to the SAS backplane board to support four SATA hard drives. SATA cables should be 1 meter (40 inches) or less in length.

The ESB2 Port configuration is:

- SATA0 to SATA connector1 goes to the SATA-to-PATA converter board, then to the optical drive
- SATA1 to x4 connector Port0 goes to SATA Drive 0 on the SAS backplane board
- SATA2 to x4 connector Port1 goes to SATA Drive 1 on the SAS backplane board
- SATA3 to x4 connector Port2 goes to SATA Drive 2 on the SAS backplane board
- SATA4 to x4 connector Port3 goes to SATA Drive 3 on the SAS backplane board
- SATA5 to SATA connector2 is an extra port that could be used for a SATA tape drive

Video Support

The main board uses the ATI* RN50 Embedded Video Controller with 32 MB of video RAM. The RN50 provides these features:

- 2D/3D video accelerator
- Dual DAC for simultaneous port support (front / rear video support)
- Resolutions from VGA up to UXGA (1600 x 1200)
- Digital Video Input/Output (DVI/DVO) interface routed to the Intel® Remote Management Module 2 (Intel® RMM) for KVM support up to 165 MHZ
- 3.3 V 32-bit / 33 MHz PCI host interface

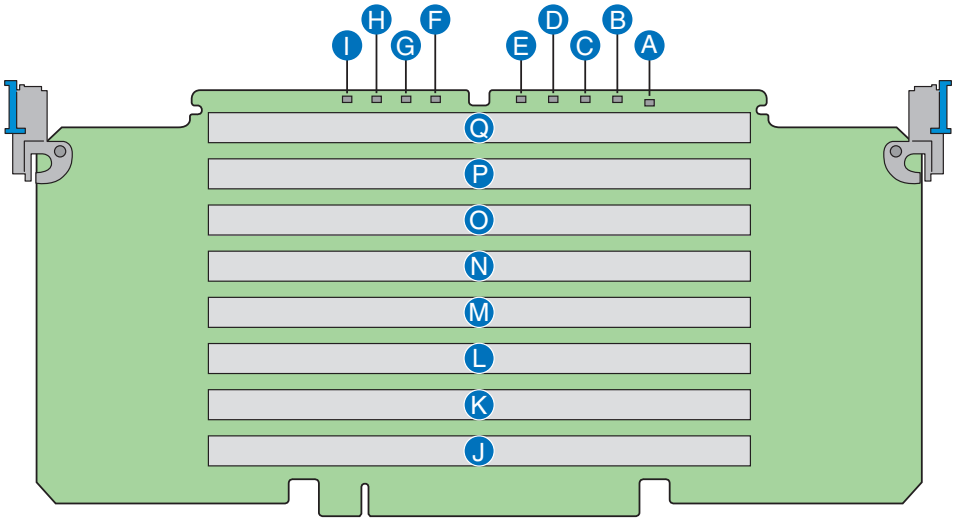
The main board has a standard DB5 video connector.

Ethernet Support

1000/100/10 Ethernet capability is supported by the ESB2 MAC and 82563EB PHY (Physical Layer). The ESB2 links to the PHY through a high-speed serial interface called Kumeran. The Kumeran interface consists of two sets of Tx/Rx pairs for a total of eight signals. The 82563EB PHY outputs two Gbit LAN ports and connects to a 1x2 RJ45 Gbit connector that is accessible at the rear of the system.

Memory Board

One, two, or four memory boards can be installed. Each memory board has eight DIMM sockets that support x4 or x8, single- or dual-rank FBD DDR2 DIMMs. FBD speeds of 533 MT/s (4-4-4, 5-5-5 latencies) and 667 MT/s (5-5-5 latency) are supported. DDR2 DRAM technologies of 512 Mbit, 1 Gbit, and 2 Gbit are supported. The memory boards connect to the main board through x16 PCI Express* connectors. The memory boards have LEDs that indicate the status of the memory board power and the status of each DIMM.



Item	Description
A	Power Good LED (green). The memory board power is good
B	DIMM1 Fault LED (amber). DIMM1 had an error and needs to be replaced
C	DIMM2 Fault LED (amber). DIMM2 had an error and needs to be replaced
D	DIMM3 Fault LED (amber). DIMM3 had an error and needs to be replaced
E	DIMM4 Fault LED (amber). DIMM4 had an error and needs to be replaced
F	DIMM5 Fault LED (amber). DIMM5 had an error and needs to be replaced
G	DIMM6 Fault LED (amber). DIMM6 had an error and needs to be replaced
H	DIMM7 Fault LED (amber). DIMM7 had an error and needs to be replaced
I	DIMM8 Fault LED (amber). DIMM8 had an error and needs to be replaced
J	DIMM1 Socket
K	DIMM2 Socket
L	DIMM3 Socket
M	DIMM4 Socket
N	DIMM5 Socket
O	DIMM6 Socket
P	DIMM7 Socket
Q	DIMM8 Socket

Figure 16. Memory Board LEDs and Connectors

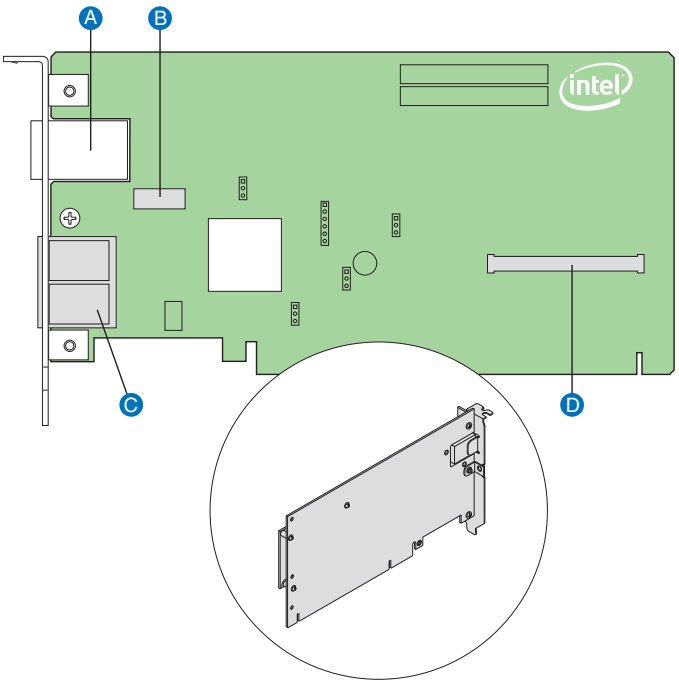
I/O Riser Board (optional)

The I/O riser board is a vertical riser that provides advanced server management with a dedicated maintenance Ethernet port, and additional dual-gigabit Ethernet ports.

The Intel® Remote Management Module 2 (Intel® RMM2) and RMM2 NIC plug into the I/O riser board to provide an upgrade path to advanced server management capabilities. When the optional Intel® RMM2 is installed, the original set of server management features continue to work and additional functionality is available. This functionality seamlessly integrates into the server, with respect to configuration functions and software support.

The Intel® RMM2 supports keyboard, mouse, video redirect, and media redirect functionality, which lets the user use the remote system to control the host server.

The Intel 82575EB PCI Express*-based Ethernet controller provides advanced networking control and capability with dual-gigabit Ethernet ports. This controller hosts the Intel® I/O Acceleration Technology II (Intel® I/OAT2) capability that provides optimization of the TCP flow. The Intel® I/O riser provides an option to disable Gbit port A and / or port B in the BIOS. Server management traffic over these ports is not supported. For management traffic, use the main board LAN ports.



Item	Description	Item	Description
A	Intel® RMM2 NIC	C	Dual gigabit LAN Ethernet ports

Item	Description	Item	Description
B	Intel® RMM2 NIC connector	D	Intel® Remote Management Module 2 connector

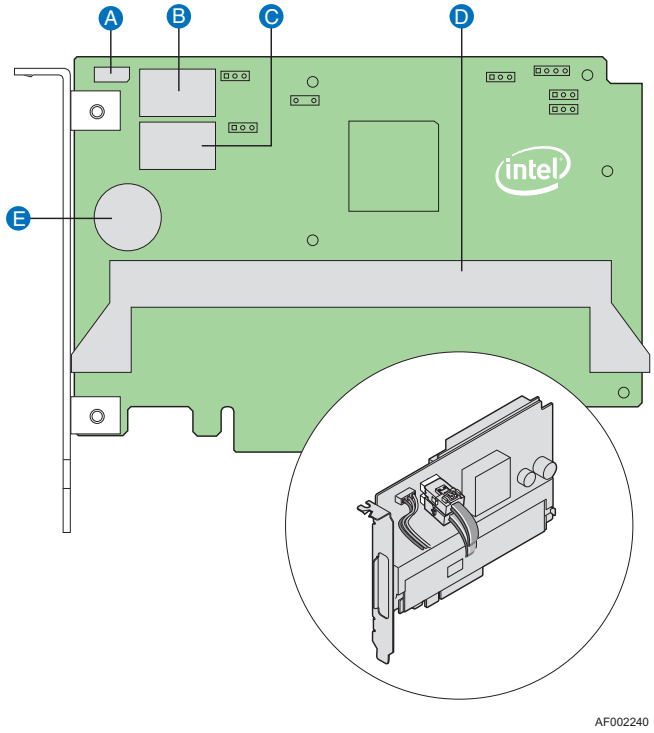
Figure 17. I/O Riser Board Connectors

SAS Riser Board (optional)

The SAS riser board works with the SAS backplane board to support eight SAS hard drives. The SAS riser uses a dedicated slot at the front of the system to make cabling to the SAS backplane convenient.

The SAS riser board uses the LSI1078* SAS controller to provide eight SAS channels at up to 3Gb/s. The riser natively supports Integrated RAID levels 0, 1, and 1E.

If the optional Intel® RAID Activation Key and DDR2-667 registered DIMM are installed, hardware RAID levels 0, 1, 5, 6, 10, 50, and 60 are enabled. The optional Intel® RAID smart battery can be installed to provide DDR2 DIMM refresh support during a power failure.

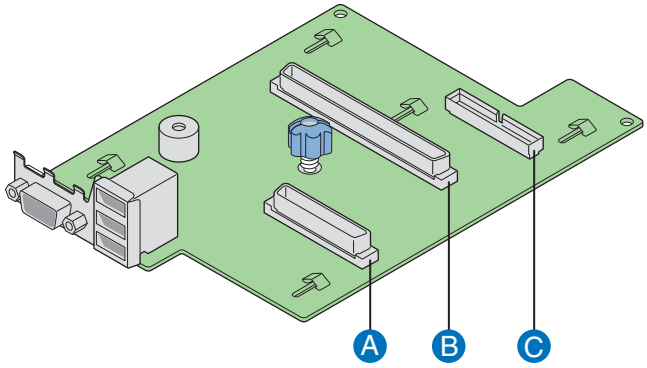


Item	Description	Item	Description
A	SES Connector	D	Intel® RAID Activation Key
B	SAS x4 Port A	E	Intel® RAID DIMM Connector
C	SAS x4 Port B		

Figure 18. SAS Riser Connectors

Front Panel Board

The front panel board provides access to the system video and USB interfaces. It also interfaces to the Standard Control Panel or Intel® Local Control Panel module. The control modules contain the front panel buttons and LEDs.



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Item	Description
A	Control panel connector
B	Main board connector
C	SAS backplane board connector

Figure 19. Front Panel Board Component Locations

The front panel I/O board provides these functions:

- Main board to SAS backplane board signal interconnects
- Fan control
- USB hub, external front panel connector for three USB 2.0 ports and high-speed hub controller to support the USB ports

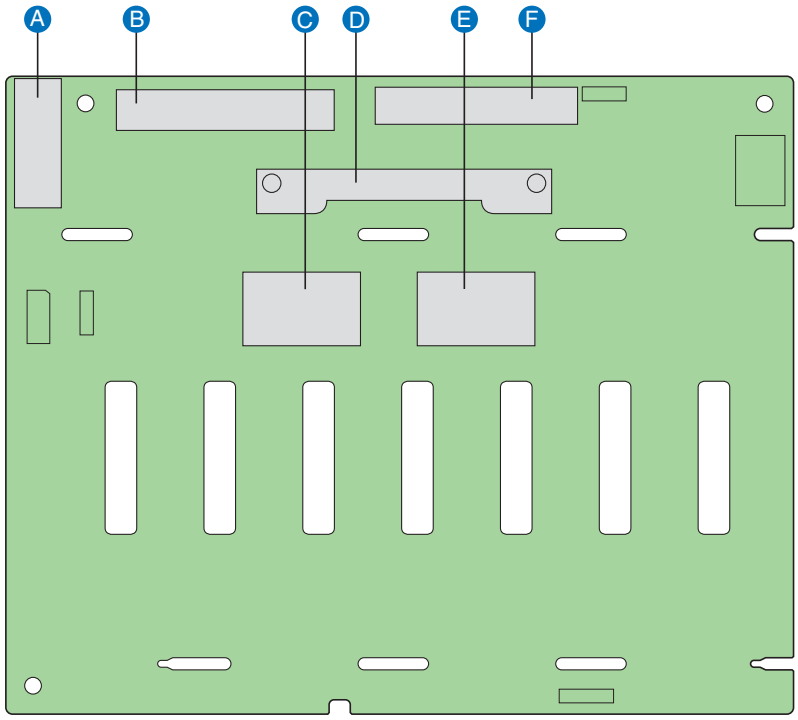
- Video output and external front panel 15-pin VGA connector
- Speaker, audible beep-code and alarm speaker and speaker drive circuitry
- NMI button

SAS Backplane Board

The SAS backplane board performs the tasks associated with hot-swapping the hard drives and enclosure monitoring and management. It provides these features and functions:

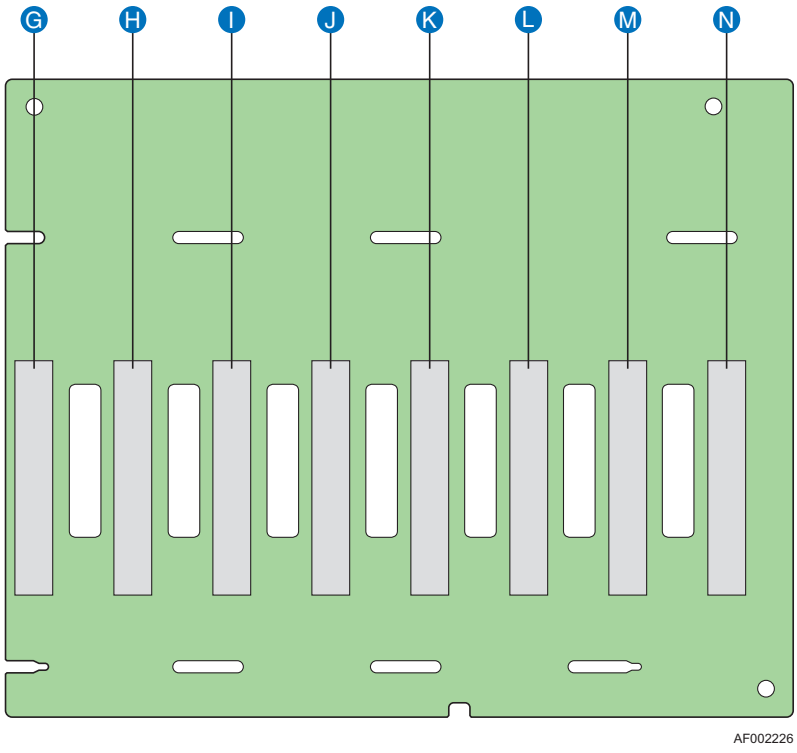
- 3 Gbit SAS port expanders provide high-speed serial data paths from the hard drives to the SAS riser board via two 4-port internal SAS cables.
- Eight blind-mate connectors mate with 2.5-inch SAS/SATA hard drives
- Vitesse* VSC-410 controller communicates drive presence and fault status
- Provides power and control for front system fans
- Provides power to DVD/CD-ROM device and tape device

Note: *Because hard drives have different cooling, power, and vibration characteristics, Intel validates specific hard drive types. See the Intel® Server System S7000FC4UR Tested Hardware and Operating System List for a list of supported drives.*



Item	Description
A	Power cable connector to CD-ROM / DVD-ROM drive and 5 ¼-inch peripheral
B	Hot-swap cooling fan connector
C	SAS x4 port B
D	Power distribution board connector
E	SAS x4 port A
F	Front panel board connector

Figure 20. SAS Backplane Connectors (Interior Side)



Item	Description
G	Hard Drive 0
H	Hard Drive 1
I	Hard Drive 2
J	Hard Drive 3
K	Hard Drive 4
L	Hard Drive 5
M	Hard Drive 6
N	Hard Drive 7

Figure 21. SAS Backplane Connectors (Drive Bay Side)

Power Distribution Board

The power distribution board provides docking connectors for the hot-swap power supply modules and it distributes power to the main board and the SAS backplane board. The board contains EEPROM FRU information storage.

Server and Platform Management

The server management embedded technologies include:

- Board instrumentation
- Sensors
- Interconnects
- Server management controllers
- Firmware algorithms
- System BIOS

The platform management system includes:

- Baseboard management controller (BMC)
- Watchdog timer
- Messaging support, including command bridging and user/session support

- Chassis device functionality, including power/reset control and BIOS boot flag support
- Alert processing device, including platform event trap (PET) and Simple Network Management Protocol (SNMP) alerts via LAN interfaces
- Platform event filtering (PEF) device
- SMTP (email alerting)
- Event receiver device. The BMC receives and processes events from other subsystems.
- Field replaceable unit (FRU) inventory device functionality
- System event log (SEL) device functionality
- Sensor device record (SDR) repository device functionality
- Sensor device and sensor scanning / monitoring
- LAN interface that supports the IPMI-over-LAN protocol (RMCP, RMCP+)
- Serial-over-LAN (SOL)
- Chassis intrusion detection and chassis intrusion cable presence detection
- Support for the Intel® Remote Management Module 2
- Platform environment control interface (PECI) thermal management support

2 Starting Up and Shutting Down the Server

Powering Up the Server

Press the power button on the front control panel. The fans start and POST begins.

Note: *It might take three minutes or longer for video to be displayed, depending on the amount of memory installed.*

The server attempts to boot from the first device on the list of available devices in the boot manager. If this device is not available, it will move to the second device. It continues down the list until it reaches the first available device.

Shutting Down the Server

1. Exit the operating system if applicable.
2. Press and hold the power button until the server shuts down.

Caution: *Powering down the server with the power button does not remove all power. The +3.3V standby power is available even when the system is not running. To remove standby power, unplug all power cords from the system.*

3 Intel® Server Deployment Toolkit

The *Intel® Server System S7000FC4UR Server Deployment Toolkit* CD provides these contents for the Intel® Server System S7000FC4UR:

- Utilities:
  - SEL Viewer Utility
  - Platform Confidence Tests
  - System Configuration Utility (Syscfg)
  - Intel® Deployment Assistant
- Platform drivers for onboard devices
- Documentation, such as the *Intel® Server System S7000FC4UR Product Guide* (this document), and other user guide documents
- Adobe* Acrobat Reader

Booting the CD starts the Intel Deployment Assistant utility. Alternatively, the drivers, utilities, and documentation content can be accessed through an HTML interface.

4 Server Utilities

Using the BIOS Setup Utility

The BIOS Setup Utility is a text-based utility that allows you to configure the system and view and change device settings and view environmental information for the system. The interface consists of several screens, called pages, each of which contains information or links to other pages. The first page in Setup displays links for general categories. These links lead to pages containing specific configuration settings.

The BIOS Setup Utility is functional through console redirection over various terminal emulation standards. This may limit some functionality due to compatibility. For example, colors, some keys or key sequences, and mouse support may be limited.

To enter the BIOS Setup Utility press <F2> when prompted during POST to access the Systems Options Menu.

See “Additional Information and Software” for a link to the Technical Product Specification where you will find details about specific BIOS setup screens.

Navigating the BIOS Setup Utility

The BIOS Setup Utility screens are divided into functional areas:

- The title bar is at the top of the screen and displays the page title. It might also display navigational information.
- The Setup Item List is a set of controllable and informational items. Each item in the list is in the left column of the screen. An item may also open a new window with additional options.
- The Item Specific Help area is on the right side of the screen and contains help text for the highlighted Setup Item. Help information might include the definition and use of an item, allowable values, and effects of the options.
- The Keyboard Command Bar is at the bottom right of the screen. It continuously displays help for special keys and navigation keys. The keyboard command bar is

context-sensitive. It displays keys relevant to current page and mode. They keyboard command bar supports these keys:.

Table 5. Setup Menu Key Use

Key	Function	Description
<Enter>	Execute Command	Press <Enter> to activate submenus when the selected feature is a submenu, or to display a pick-list if a selected feature has a value field, or to select a sub-field for multi-valued features like time and date. If a pick list is displayed, <Enter> will undo the pick list, and allow another selection in the parent menu.
<Esc>	Exit	<Esc> provides a way to back out of any field. This key will undo the action of <Enter>. When the <Esc> key is pressed while editing any field or selecting features of a menu, the parent menu is re-entered. When <Esc> is pressed in a submenu, the parent menu is re-entered. When <Esc> is pressed in a major menu, the exit confirmation window is displayed and the user is asked whether changes should be saved or discarded.
Up arrow	Select item up	The up arrow is used to select the previous value in a menu item's option list, or a value field pick list. Press <Enter> to activate the selected item.
Down arrow	Select Item down	The down arrow is used to select the next value in a menu item's option list, or a value field pick list. Press <Enter> to activate the selected item.
Left and right arrows	Select menu	The left and right arrow keys are used to move between the major menu pages. The keys have no affect if a submenu or pick list is displayed.
<Tab>	Select field	Use <tab> to move between fields on a page.
<->	Change value	The minus key changes the value of the selected item to the previous value. This key scrolls through the values in the associated pick list without displaying the full list.
<+>	Change value	The plus key changes the value of the selected item to the next value. This key scrolls through the values in the associated pick list without displaying the full list. On 106-key Japanese keyboards, the plus key has a different scan code than the plus key on the other keyboard, but it has the same effect.
<F9>	Setup defaults	Pressing <F9> causes the following to appear: `Load default configuration now? [Y] [N]` If <Y> followed by <Enter> is pressed, all Setup fields are set to their default values. If <N> followed by <Enter> pressed, or if <Esc> is pressed, the user is returned to where they were before <F9> was pressed without affecting any field values.

Table 5. Setup Menu Key Use

Key	Function	Description
<F10>	Save and exit	Pressing <F10> causes the following to appear: `Save Configuration changes and exit now? [Y] [N]` If <Y> followed by <Enter> is pressed, all changes are saved and Setup is exited. If <N> followed by <Enter> pressed, or if <Esc> is pressed, the user is returned to where they were before <F10> was pressed without affecting any existing values.

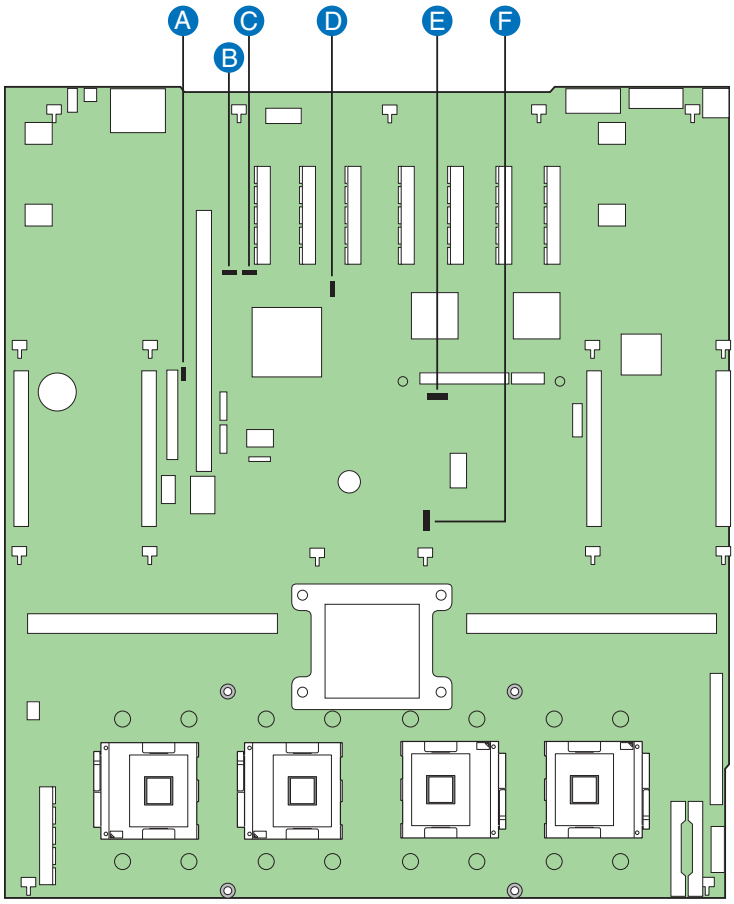
Each BIOS Setup Utility menu page contains a number of features. Some features are used for informative purposes only, and other features are associated with a value field that you can configure. Depending on the security option in effect, a menu feature's value may be changeable. If a value cannot be changed, the value field for that feature is inaccessible.

System Configuration Reset

You can restore the system configuration to the default values. When you reset the system to the default values, The BIOS loads default system configuration values during the next POST. Use one of these methods if you want to return to the defaults:

- Use <F9> in the BIOS Setup Utility.
- In the BIOS Setup Utility Exit menu, select “Load Default Values”.
- Use the main board CMOS/NVRAM Clear jumper (J3C3).
  - Power down the system but do not remove the AC power cords.
  - Move the NVRAM Clear jumper to enabled/clear CMOS (connect pins 2 and 3).
  - Move the NVRAM Clear jumper to default/normal mode (connect pins 1 and 2).
  - Power on the system.

Note: *Intel® Server System S7000FC4UR does not support any other mechanisms to clear NVRAM.*



AF002276

Label	Name	Location	Default	Stuffed Jumper State
A	Rolling BIOS	J3D1	Empty Stuff	1 - 2 = Force other bank 2 - 3 = Normal mode
B	Password disable or clear	J3C2	Stuff Empty	1 - 2 = Password protect 2 - 3 = Password disabled / cleared
C	Clear CMOS / NVRAM	J3C3	Stuff Empty	1 - 2 = Normal 2 - 3 = Forced CMOS / NVRAM clear
D	BMC force update	J5C1	Stuff Empty	1 - 2 = Disable BMC force update 2 - 3 = Enable BMC force update
E	BMC flash write protect	J6D1	Stuff Empty	1 - 2 = Disable flash write protect 2 - 3 = Enable flash write protect
F	Circuit breaker	J6F1	Empty Stuff	1 - 2 = 20A/110V (USA) 2 - 3 = 15A/100V (Japan)

Rolling BIOS

The rolling BIOS feature provides a fault-tolerant BIOS update mechanism. The BIOS relies on specialized hardware and additional flash space to support the rolling BIOS feature.

The Intel® Server System S7000FC4UR supports two physical 4 MB flash parts that each store a separate BIOS image. The flash part that holds the BIOS image used to boot the system is called the Primary Flash Bank. The second flash part holds the alternate or backup BIOS image and is called the Secondary Flash Bank. All BIOS flash updates are made to the Secondary Flash Bank.

The BIOS flash update process works like this:

1. Boot the system.
2. Use the EFI Flash or the Intel® One Flash Update (OFU) utility to update the BIOS.
3. Reset the system.
4. The rolling BIOS automatically:
   - Boots the system with the old BIOS image.
   - Validates the new BIOS image.
5. If the new image flashed successfully, then the BIOS automatically resets the system and boots with the new BIOS image.
6. If the new BIOS image fails to boot, then the rolling BIOS boots with the old, known-good BIOS image.

Booting from Backup Image

There are several possible scenarios in which a manual rollback to the previous BIOS image might be necessary:

- The user successfully updated the BIOS but later learns that the new BIOS image does not provide the desired functionality.
- The user successfully updated the BIOS but later changes the system configuration in a way that causes the new BIOS to stop working.
- A power failure occurs during the flash update. The user reset the system and was not able to boot to the new BIOS.

To boot from the backup image:

1. Power down the system, and remove the system cover.
2. Move the Rolling BIOS jumper to cover pins 1-2.
3. Plug in and boot the system. The system boots from the BIOS image stored on the Secondary Flash Bank.
4. If the BIOS image in the other bank is corrupted or non-functional, perform a BIOS update to overwrite this bad BIOS image.

5. Power down the system and move the Rolling BIOS jumper back to cover pins 2 - 3.
6. Replace the system cover, plug in the system, and boot it. The system boots from the newly flashed image and a known-good backup image remains in the other bank.

Console Redirection

The BIOS supports keyboard and video redirection through a serial link (COM port). When console redirection is enabled, local (host server) keyboard input and video output are passed to both the local keyboard and video connections and to the remote console through the serial link. Keyboard inputs from both sources are valid and video is displayed to both outputs.

With console redirection, the system can be operated without a host keyboard or monitor and run entirely from a remote console. Setup and any other text-based utilities can be accessed through console redirection.

Serial Configuration Settings

When redirecting through a modem instead of through a null modem cable, the modem needs to be configured with:

- Auto-answer (Example: ATS0=2, to answer after two rings).
- Modem reaction to DTR set to return to command state (Example: AT&D1). Failure to provide this results in the modem dropping the link when the server reboots, with AT&D0, or becoming unresponsive to server baud rate changes, with AT&D2).
- Handshaking must be set to RTS/CTS + CD (carrier detect) for optimum performance.

  Handshaking must be set to Xon/Xoff + CD if the emergency management port (EMP) shares the COM port with serial redirection. With this form of handshaking, the server is prevented from sending video updates to a modem that is not connected to a remote modem. If this is not selected, video update data being sent to the modem inhibits many modems from answering an incoming call. An EMP option utilizing CD should not be used if a modem is not used and the CD is not connected.
- Both the EMP and console redirection require N, 8, 1 mode (no parity, 8-bit data, 1 stop bit).

The BIOS does not require that the splash logo be turned off for console redirection to function. The BIOS supports multiple consoles, some of which are in graphics mode and some in text mode. The graphics consoles can display the logo while the text consoles receive the redirected text.

Console redirection ends at the beginning of the Legacy OS boot (INT 19h).

Keystroke Mappings

During console redirection, the remote terminal, which may be a dumb terminal or a system with a modem running a communication program, sends keystrokes to the local server. The server passes video back over this same link. The keystroke mappings follow VT-UTF8 format with the following extensions.

Setup Alias Keys

The <Del> and <Ctrl>-<function key> combinations are synonyms for the <F2> or "Setup" key. These are not prompted for in screen messages. These hot keys are defined only for console redirection support, and are not used on locally attached keyboards.

Standalone <Esc> Key for Headless Operation

To complete an escape sequence, the timeout must be two seconds for entering additional characters following an escape.

- <Esc> followed by a two-second pause is interpreted as a single escape.
- <Esc> followed within two seconds by one or more characters that do not form a sequence described in this document are interpreted as <Esc> plus the character or characters, not as an escape sequence.

The following escape sequences are input sequences; they are sent to the BIOS from the remote terminal.

Table 6. Console Redirection Escape Sequences

Escape Sequence	Description
<Esc>R<Esc>r<Esc>R Defaults to "disabled".	Remote console reset
<Esc>(	BMC Mux Switch escape sequence
<Esc>CDZt<terminal-type-number>	Dynamic terminal type choice 0 = PC-ANSI (the only current terminal type) 1 = VT100 (not implemented, but honored as VT100+) 2 = VT100+ 3 = VT-UTF8
<Esc>-CDZ0	Inhibit console redirection
<Esc>-CDZ1	Restart console redirection
<Esc>-CDZ2	"Soft" inhibit console redirection without serial port or modem reset

Limitations

BIOS console redirection terminates after an EFI-aware operating system calls EFI Boot Service ExitBootServices. The operating system is responsible for continuing the Console Redirection after that point. BIOS console redirection is a text console. Graphical data, such as a logo, are not redirected.

Interface to Server Management

If the BIOS determines that console redirection is enabled, it passes the baud rate through the Intelligent Platform Management Bus (IPMB) to the appropriate management controller.

Sample Setup for Console Redirection

Below is an example of how to configure the console/host and server for console redirection. In this example, the console is running under Windows*. The console and server are directly connected through the serial ports using a serial null modem cable.

Server Configuration

1. Power on the server.
2. When prompted, press <F2> to enter the System Options Menu.
3. Select the BIOS Setup menu.
4. Use the arrow keys move to the Server Management menu.
5. At the Server Management menu, select Console Redirection.
6. Select “COM1 Console Redirection”.
7. Set Console Redirect to “Enabled”.
8. Set the Bit Rate to “115.2K”.
9. Set the Flow Control to “RTS/CTS”.
10. Set the Terminal Type to “PC-ANSI”.
11. Press <F10>.
12. At the prompt to save changes and exit BIOS Setup, select “Yes” and press <Enter>. The server reboots and console redirection is enabled.
13. Power down the server and configure the console.

Console Configuration

1. Boot the console into the operating system.
2. Click “Start” in the task bar.
3. Select Programs > Accessories > Communications. Click “Hyperterminal”.
4. At the Connection Description window, enter “guest” for the name and click “OK”.

5. At the Connect To window, select the COM port of the console where the null modem is connected. In this example, it is COM1.
6. At the COM1 Properties window, select “115200” in the Bits per second (Baud rate) box to match that which was configured on the server.
7. Select “Hardware” for the Flow Control to match that which was configured in BIOS Setup (CTS/RTS is the hardware flow control).
8. Leave the default settings for the other boxes. Click “OK” to accept the settings and enter the Hyperterminal screen.
9. Power on the server. The console displays the redirection after the video synchronizes on the server.

Platform Confidence Test

The Platform Confidence Test (PCT) diagnostic utility is included on the *Intel® Server System S7000FC4UR Server Deployment Toolkit* CD. It probes for the hardware at the start of each test and reports the identified components. In this way, the PCT indirectly identifies many assembly and cabling errors (broken or improperly seated cables) when installed components are not reported. The test displays results for field replaceable units, such as the processor modules, the server board, drives, and memory.

Three Platform Confidence Tests (PCT) are available. The duration of each test depends on the number of processors and the amount of memory installed. On completion of each test and after the test results are displayed, the program returns to the main menu.

Quick Test

The quick test checks the core components of the system to ensure they are functioning properly. The test modules that are run during the quick test include:

- Cache
- MCH
- Memory
- Processor
- Real-time clock

Comprehensive Test

The comprehensive test performs a thorough test of the system components. The test modules that are run during the comprehensive test include:

- Baseboard management controller
- Cache
- Graphics
- Hard drives

- ICHx
- Keyboard
- MCH
- Memory
- NIC
- PCI bus
- Processor
- SAS
- Super I/O
- Universal serial bus

The processor floating point unit (FPU) is tested and more extensive tests are run on the memory and cache. Extensive tests are run on the onboard peripheral controllers, integrated components, and the chipset.

Comprehensive Test with Continuous Looping

This is identical to the comprehensive test, but it runs continuously until the operator interrupts the test cycle by pressing the <F10> key. The system transfers to the test menu screen with the pass / fail status displayed, along with the number of test loops completed.

Running the Platform Confidence Test

1. Insert the *Intel® Server System S7000FC4UR Server Deployment Toolkit* CD into a Windows*-based system.
2. Allow the autorun feature to launch the graphical user interface. If autorun does not launch the GUI, launch it manually by double-clicking the CD-ROM drive.
3. From the Drivers and Utilities menu, choose “EFI” and then “Platform Diagnostics Utility”.
4. Choose an appropriate option:
   - If you want to run the Platform Diagnostics Utility from a CD, burn the *.iso image to a CD.
   - If you want to run the Platform Diagnostics Utility from a USB flash drive, install the flash drive onto your system, open the *.zip file and copy the files to the root of your USB flash drive.
5. Install the USB flash drive or the CD that contains the Platform Diagnostics utility into your Intel® Server System S7000FC4UR to be tested. Boot the system.
6. Press <F2> when prompted to enter the BIOS Setup utility.
7. From the BIOS Setup utility, go to the Boot Manager menu and choose “EFI Shell.”

8. The Platform Diagnostics Utility starts to load and prompts you to respond to the licensing agreement. Upon your agreement, the utility starts and you will see the menu of test options.

Intel® Deployment Assistant

The Intel® Deployment Assistant provides a single interface with an easy to use HTML-like graphical user interface to ease the process of setting up and deploying an Intel server from initial boot through the initiation of an unattended OS installation. These setup and deploy tasks can be performed with the Intel® Deployment Assistant:

- Update the system BIOS, firmware, and FRUSDR
- Configure server management settings
- Launch an unattended OS installation

The Intel® Deployment Assistant will allow a system administrator to:

- Update an Intel server with the latest system software. Updates can be procured from a set URL (support.intel.com – which can be customized by OEM), a network drive, or removable media (Intel® Deployment Assistant CD or USB key). The firmware components that can be updated using Intel® Deployment Assistant are: BIOS, ESB2, HSC, LCP, as well as SDRs.
- Configure the most common options of the BIOS and firmware.
- Configure a RAID volume on attached hard drives and install an operating system.
  - The installation is fully unattended except for a license screen agreement that the user needs to agree to.
  - The latest drivers for all the on-board components can be inserted during the OS installation
- Save SUP, driver updates, and chosen configuration settings in a profile for later use. This allows quick restoration of the same server or “cloning” (migration of configuration) to identical model servers.

System Setup and Configuration Utilities

Setup and configuration utilities are either on the Server Deployment Toolkit CD or the Intel® Server Management Software CD, or included in the System Firmware Update Package that is posted to http://support.intel.com/support/motherboards/server/S7000FC4UR/

Available utilities for WinPE include:

- SELViewer
- Save and Restore System Configuration (SysConfig)

- FWPIAUPD Firmware Load utility
- iFlash32 BIOS Load utility
- FRUSDR Load utility

Available utilities for EFI include:

- SELViewer
- Save and Restore System Configuration (SysConfig)
- FWPIAUPD Firmware Load utility
- iFlash32 BIOS Load utility
- FRUSDR Load utility

Available utilities for Microsoft Windows Server 2003 include:

- One-Boot Flash Update (OFU)

Available utilities for Linux include:

- One-Boot Flash Update (OFU)
- Save and Restore System Configuration (SysConfig)

Save and Restore System Configuration (SYSCFG)

This command-line utility is used to:

- Save a subset of BIOS and firmware settings to a file.
- Write BIOS and firmware settings from a file to a server.
- Configure selected firmware settings.
- Configure selected BIOS CMOS settings.
- Change BIOS boot order.
- Display selected firmware settings.
- Display selected BIOS settings.

FWPIAUPD Firmware Load Utility

The Firmware Update utility updates these server management controllers:

- Baseboard management controller (BMC)
- Hot-swap controller (HSC)
- LCD control panel (LCP)

One-boot Flash Update Utility (OFU)

The One-Boot Flash Update (OFU) utility is an OS-present command-line utility that uses configuration (CFG) files to allow users to update

- System BIOS
- Server management firmware of the baseboard management controller (BMC)
- Hot-swap controller (HSC) firmware
- Intel® Local Control Panel firmware
- Field replaceable units (FRU). Existing FRU data can also be modified.
- Sensor data records (SDR)

IFLASH32 BIOS Load Utility

Use the BIOS Update utility to upgrade the system BIOS. For information about the rolling BIOS feature, see “Rolling BIOS” on page 45.

FRUSDR Load Utility

The FRUSDR Load utility updates and modifies the server management subsystem's product level field replacement unit data and sensor data record repository, and displays the System Management BIOS (SMBIOS) non-volatile storage components.

The FRU is initially factory-programmed and can be updated later by using the FRUSDR utility to update specific FRU areas and fields. You cannot change the size of any FRU area from the size defined in the original FRU Header.

Run the FRUSDR Load utility each time you upgrade or replace the hardware in your server; excluding add-in cards, hard drives, fans, and RAM. The FRUSDR Load utility programs the sensors that the server management software monitors.

With the FRUSDR Load Utility, you can:

- Discover the product configuration based on instructions in a master configuration file.
- Display the FRU information.
- Update the non-volatile storage device associated with the baseboard management controller (BMC) that holds the SDR and FRU information.
- Generically handle FRU devices that might not be associated with the BMC.
- Supply command lines and interactive input through the standard input device.
- View and direct results to the standard output device.

Extensible Firmware Interface (EFI) Shell

The EFI shell application allows other EFI applications to be launched, EFI device drivers to be loaded, and operating systems to be booted. The combination of the EFI firmware and the EFI Shell provides an environment that can be modified and adapted to many hardware configurations.

The EFI shell provides a set of basic commands to manage files and EFI NVRAM shell and boot variables. A list of these basic commands is in Table 7.

Extensive information is available on the EFI website at http://developer.intel.com/technology/efi:

- For detailed information about the EFI shell, its commands, and the ability to develop within the environment, see the EFI How-to Guide at http://developer.intel.com/technology/efi/howto.htm.
- For a sample implementation, see http://developer.intel.com/technology/efi/main_sample.htm
- For the EFI Application Toolkit, see http://developer.intel.com/technology/efi/toolkit_overview.htm. The toolkit helps you develop your own shell commands.

Table 7. EFI Shell Commands

Command	Description
<drive_name>:	Change drives. For example, entering fs0: and pressing the <Enter> key changes the drive to the LS-240 drive
alias [-bdv] [sname] [value]	Sets or gets alias settings
attrib [-b] [+/- rhs] [file]	Views or sets file attributes
bcfg -?	Configures boot driver and load options in EFI NVRAM
botmaint	Launches the Boot Maintenance Manager
break	Executes a breakpoint
cd [path]	Changes the directory
cls [background color]	Clears the screen
comp file1 file2	Compares two files
connect [-r] [-c] Handle# ½DeviceHandle# DriverHandle#	Binds the EFI driver to a device and starts the driver
cp [-r] file [file] ... [dest]	Copies files and directories, [-r] = recursive
date [mm/dd/yyyy]	Gets or sets the date
dblk device [Lba] [Blocks]	Performs a hex dump of BlkIo Devices
devices [-b] [-1XXX]	Displays devices

Table 7. EFI Shell Commands

Command	Description
devtree [-b] [-d]	Displays device tree
dh [-b] [-p prot_id] | [handle]	Dumps handle information
disconnect DeviceHandle# [DriverHandle# [ChildHandle#]	Disconnects device from driver
dmem {address] [size] [;MMIO]	Displays the contents of memory
dmpstore	Dumps the variable store
drivers [-b] [-lXXX]	Displays drivers
drvcfg [-c] [-lXXX] [-f] [-v] [-s]	Invokes the driver configuration protocol
drvdiag [-c] [-lXXX] [-s] [-e] [-m]	Invokes the driver diagnostics protocol
echo [[-on | -off] | [text]	Echoes text to the standard output device or toggles script echo
edit [filename]	Opens the text editor allowing you to create or edit a file
eficompress infile outfile	Compresses an EFI file
Efidecompress infile outfile	Decompresses an EFI file
endfor	Provides a delimiter for loop constructs (scripts only)
endif	Provides a delimiter for IF THEN constructs (scripts only)
for var in <set>	
goto label	Makes batch file execution jump to another label
guid [-b] [sname]	Dumps known guide ids
help [-b] [internal_command]	Displays help information
hexedit [[-f]FileName|[-d DiskName Offset Size]|[-m Offset Size]]	Edits in HEX mode
if [not] condition then	Provides conditional constructs (scripts only)
load driver_name	Loads a driver
loadbmp [-c] [-t] [-i[UGA Instance]] file	Displays a bitmap file on the screen
loadpcirom romfile	Loads a PCI option ROM
ls [-b] [dir] [dir] ...	Obtains directory listings
map [-bdvr] [sname[:]] [handle]	Maps sname to device path

Table 7. EFI Shell Commands

Command	Description
mem [address] [size] [;MMIO]	Dumps Memory or Memory Mapped IO
memmap [-b]	Dumps memory map
mkdir dir [dir]	Creates a new directory
mm address [Width] [;Type] [n]	Memory Modify: type = Mem, MMIO, IO, PCI, [n] for non interactive mode when inside a .nsh file
mode [col row]	Sets or gets the current graphics mode
mount BlkDevice [sname[:]]	Mounts a file system on a block device
mv [src…] [dst]	Move one or more files/directories to destination
pause	Prompts to quit or continue (scripts only)
pci [bus_dev] [func]	Displays PCI device information
rconnect DeviceHandle# [DriverHandle# [ChildHandle#]] | [-r]	Reconnects one or more drivers from a device
reset [reset_string]	Performs a cold reset
rm file/dir [file/dir]	Removes files or directories
setsize file	Sets size of a new file
stall microseconds	Delays for the specified number of microseconds
time [hh:mm:ss]	Gets or sets the time
type [-a] [-u] [-b] file	Displays the contents of a file
ver	Displays version information
vol fs [volume_label]	Sets or displays a volume label

5 User-Serviceable Components

Note: *This chapter provides instructions for adding and replacing hot-swappable and user-serviceable system components and memory DIMMs. A service technician is not required to perform the procedures described in this chapter.*

Before You Begin

Before working with your server product, pay close attention to the "Safety Information" on page iii.

Use the equipment log to record the model and serial numbers of the server and all installed options.

Tools and Supplies Needed

- Phillips* (cross head) screwdriver, #2 bit
- Flat-head screwdriver
- Antistatic wrist strap and conductive foam pad (recommended)

System References

Unless otherwise noted, all references to left, right, front, top, and bottom assume the reader is facing the front of the chassis as it would be positioned for normal operation.

Removing and Installing the Chassis Cover

Warning: *Make sure the rack is anchored securely so it will not tilt forward when the server is extended. A crush hazard exists if the rack tilts forward. This could cause serious injury.*

Cautions:

- *For proper cooling and airflow, do not operate the server with the cover removed. Do not leave the chassis cover open or a system fan removed any longer than necessary; system cooling could be reduced.*
- *The server comes with a removable top cover that allows the PCI cards, memory boards, and the system fans to be hot-swapped, and other system components to be serviced. Except for components described in this chapter, all servicing must be done by a qualified service technician.*

- *Provide electrostatic discharge (ESD) protection by wearing an antistatic wrist strap attached to chassis ground of the system-any unpainted metal surface-when handling components.*

Removing the Top Cover

Before removing the top cover, observe these safety guidelines:

1. If you are not replacing a hot-swap component:
   - — Turn off and disconnect all peripheral devices connected to the server.
   - — Power down the system by pressing and holding the power button on the front of the chassis for several seconds.
   - — After the server shuts down, unplug both AC power cords to remove standby power from the system.
2. If the system is mounted in a rack, slide it out far enough to expose the entire top cover.
3. Unscrew the two captive screws on the faceplate. See letter “A” in the figure below.
4. Slide the top cover toward the rear until it stops, then lift the cover to remove it. See letter “B” in the figure.

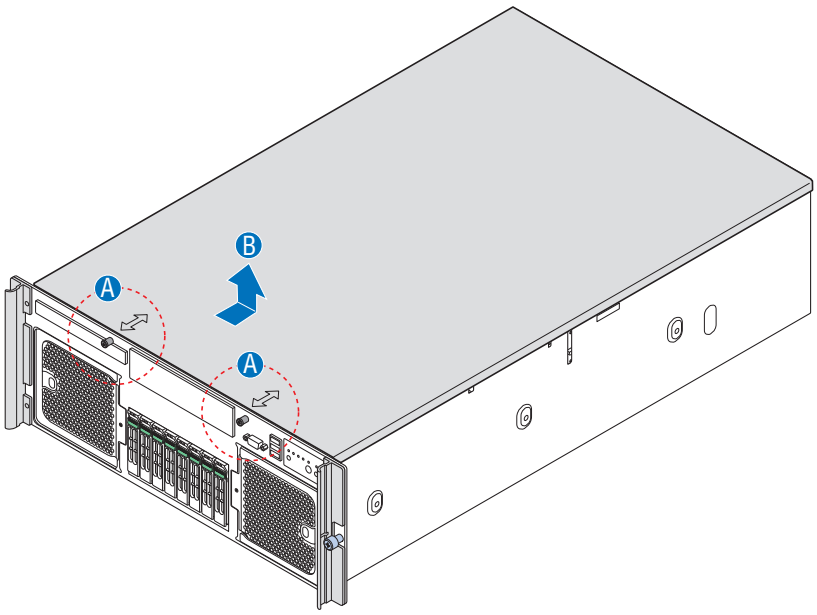


Figure 22. Removing the Chassis Cover

Installing the Top Cover

1. Place the cover over the chassis so that the side edges of the cover sit just inside the chassis sidewalls and the tabs on the cover align with the slots in the chassis.
2. Slide the cover forward until it clicks into place. See letter “A” in the figure below.
3. Tighten the captive screws on the faceplate. Use a torque setting of 0.90 N M (8 in lb). See letter “B” in the figure.
4. Reconnect all peripheral devices and the AC power cord.
5. Slide the system back into the rack.

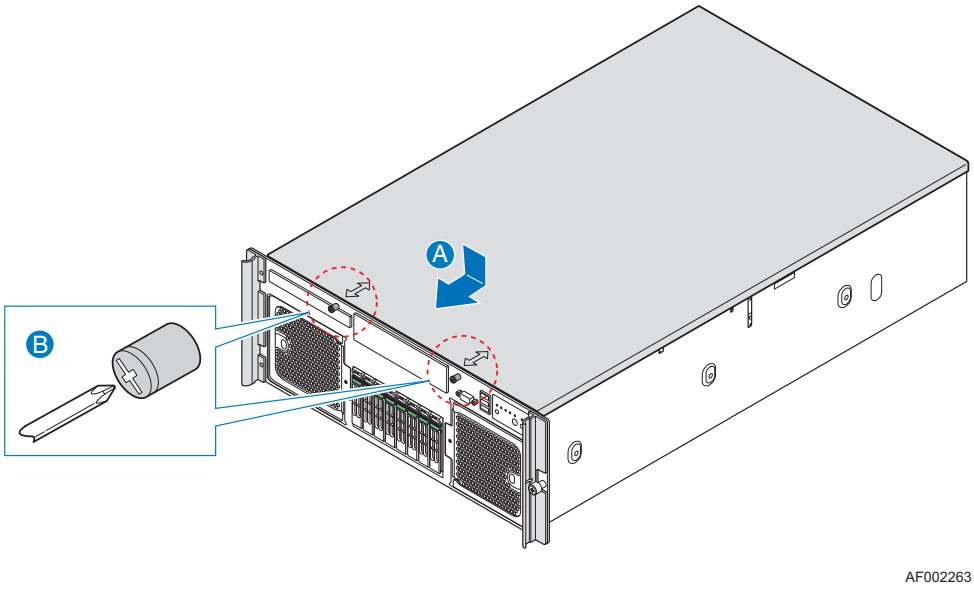


Figure 23. Installing the Chassis Cover

Hot-swapping a Front System Fan

Two cooling fan assemblies are located at the front of the chassis. Each assembly contains two fans. You cannot replace the individual fans within the assembly, but you can replace each fan assembly. You can replace a failed cooling fan assembly without turning off the power to the server only if the remaining fans are fully functional. Each fan assembly uses an amber LED to indicate a failed fan condition. If the amber LED is on, the fan assembly needs to be replaced. The LED remains off during normal operation.

Cautions:

- *System cooling is reduced during the fan replacement process. Do not leave a system fan removed for longer than two minutes.*
- *Do not touch the fan blades while they are turning.*

1. Locate the fan assembly you are replacing. If a fan in the assembly has failed, the amber LED is lit. See letter “A” in Figure 27.
2. Press the green button on the front of the fan assembly to release the handle. See letter “B” in the figure.
3. Use the handle to pull the fan from the system. See letter “C” in the figure.

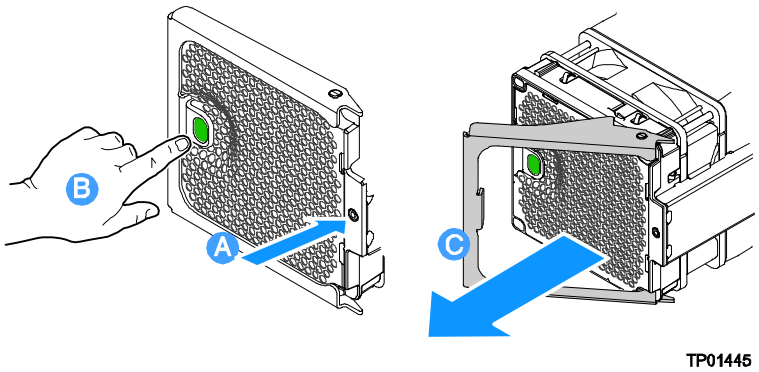


Figure 24. Removing a Front System Fan

4. Open the handle on the replacement fan assembly.
5. Slide the replacement fan into the fan bay. See letter “A” in Figure 28.
6. Push the handle closed until it clicks into place. See letter “B” in the figure

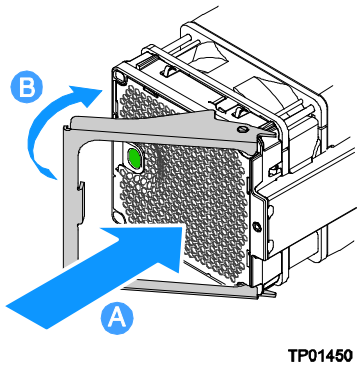


Figure 25. System Fan Module Installation

Hot-swapping a Rear System Fan

Four cooling fans are located at the rear of the chassis. The top cover must be removed before these fans can be serviced. You can replace a failed cooling fan assembly without turning off the power to the server only if the remaining system fans are fully functional.

Each fan assembly uses an amber LED to indicate a failed fan condition. If the amber LED is on, the fan assembly needs to be replaced. The LED remains off during normal operation.

Cautions:

- *System cooling is reduced during the fan replacement process. Do not leave a system fan removed for longer than two minutes.*
- *Do not touch the fan blades while they are turning.*

1. Locate the fan assembly you are replacing. If a fan in the assembly has failed, the amber LED on the fan model will be lit.
2. Grasp the fan by the finger holes and squeeze together.
3. Lift the fan upward. See the following figure.

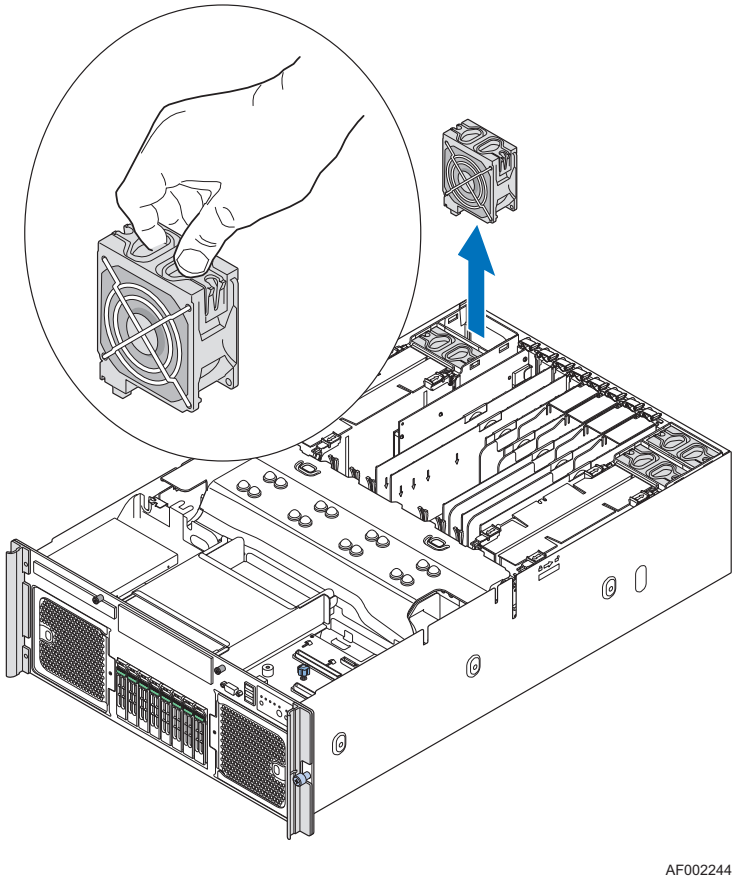


Figure 26. Removing a Rear System Fan

4. Lower the replacement fan into the fan bay.
5. Push down on the fan until it clicks into place.

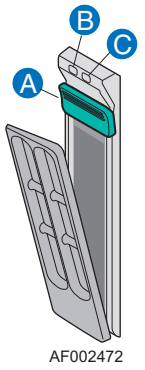
Hot-swapping a Hard Drive

The server supports eight hot-swap drive carriers. Each carrier holds a standard 2.5-inch SATA or SAS hard drive.

The procedures in this section describe how to determine drive status, remove a faulty drive, and install a new drive. If a drive is in a redundant configuration, you can install or replace a hot-swap hard drive without powering down the server.

Caution: *To ensure proper airflow and server cooling, all drive bays must contain either a carrier with a hard drive installed in it or a carrier with an air baffle installed.*

The drive carriers contain light-pipes that allow LED indicators to show through the bezel to display the hard drive status.



Item	Description	
A.	Latch	
B.	**LED State**	**Description**
	Green on	SAS drive is installed and working correctly
	Green blink	Hard drive is active
C.	Amber on	Hard drive or slot failure
	Amber slow blink (~1 Hz)	Predictive hard drive / slot failure or rebuild is in process
	Amber fast blink (~2.5 Hz)	Hard drive rebuild interrupted or rebuild on empty slot

Figure 27. Hard Drive Carrier

Removing a Hard Drive Carrier

1. Press the green drive carrier latch. See letter “A” in the following figure.
2. Pull the handle to remove the drive cage from the chassis. See letter “B” in the figure.
3. Place the drive cage on a clean, static-free work surface.

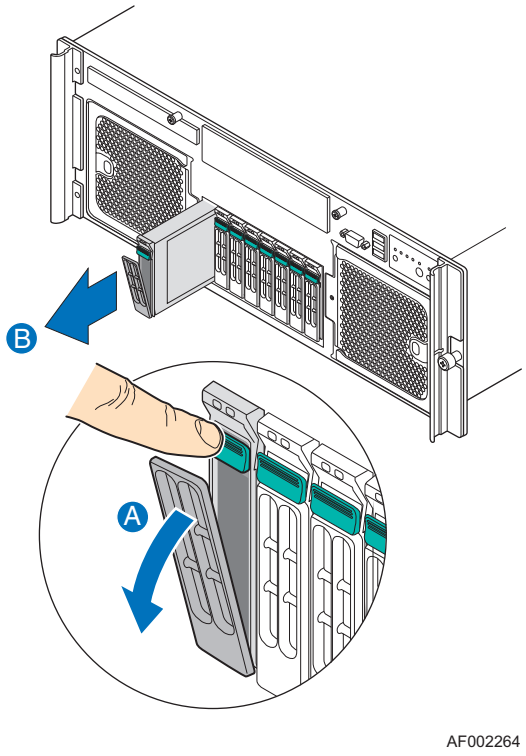


Figure 28. Removing a Hard Drive Carrier

Mounting a Hard Drive in a Carrier

1. Remove the hard drive from the protective wrapper and place it on a clean ESD-protected work surface.
2. Record the model and serial number of the drive in your equipment log.
3. Set any jumpers and/or switches on the drive according to the drive manufacturer's instructions.
4. If the drive carrier is installed in the chassis, remove it and place it on a clean static-free work surface. For instructions, see “Removing a Hard Drive Carrier” on page 63.

5. Remove the four screws that hold the air baffle in place. See letter “A” in the following figure.
6. Remove the air baffle from the carrier. See letter “B” in the figure.
7. Store the air baffle for future reinstallation.

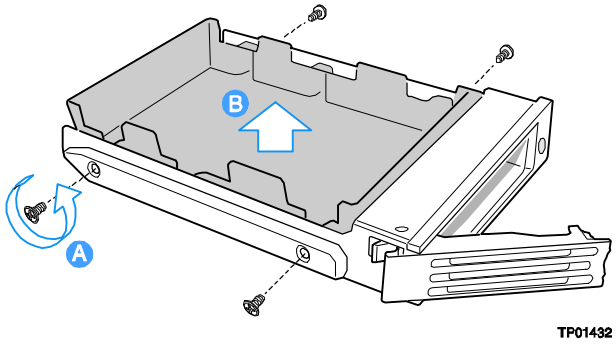


Figure 29. Removing the Air Baffle from the Hard Drive Carrier

8. Position the drive in the carrier with the label-side up and the connector end of the drive facing the back of the carrier. See letter “A” in the figure.
9. Align the holes in the drive to the holes in the drive carrier slide track and insert the screws that were attached to the air baffle. See letter “B” in the figure.

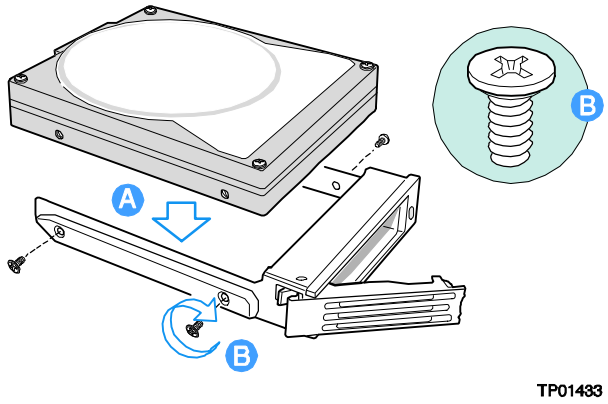


Figure 30. Attaching the Hard Drive to the Carrier

Installing a Hard Drive Carrier

1. With the drive carrier handle fully open, slide the drive carrier all the way into the drive bay in the chassis. See letter “A” in the following figure.
2. Use the handle to push the carrier until it docks in the chassis, then close the drive carrier handle. See letter “B” in the figure.

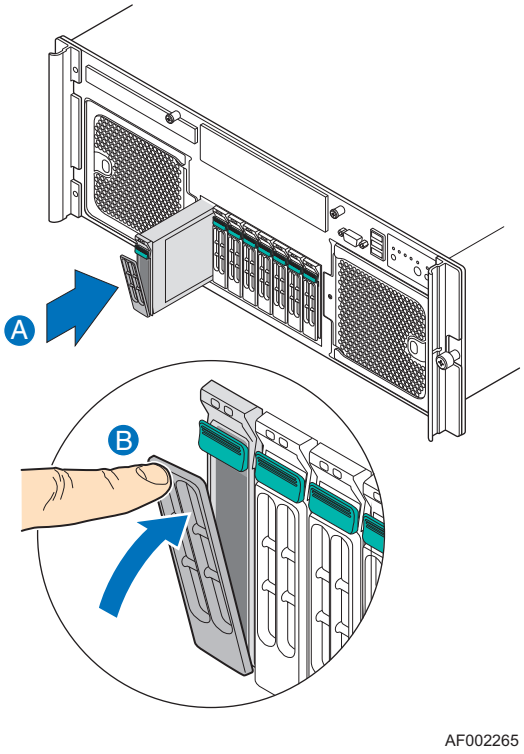
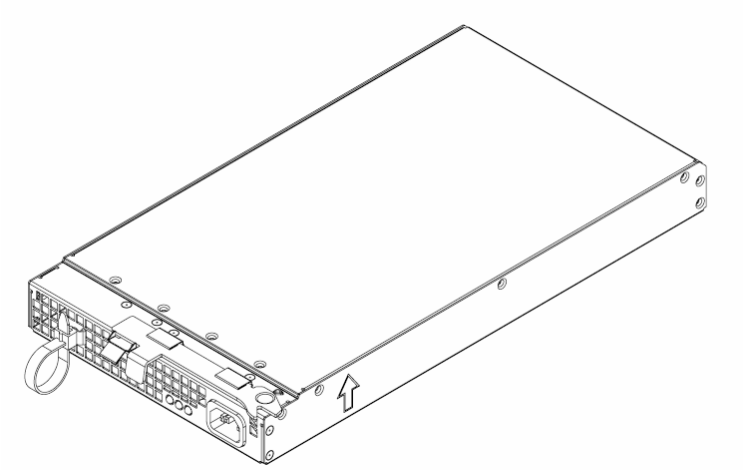


Figure 31. Installing Hard Drive into Server

Hot-swapping a Power Supply

If your server is configured with two power supplies, you can replace a failed or failing power supply without powering down the server. Use the LEDs at the rear of the power supply to determine the power supply status. Each power supply module has three status LEDs next to the input connector. If the center LED is lit, the power supply needs to be replaced.



LED Location	Purpose	Description
A (left)	Power Good LED (green)	This LED is lit whenever the power is turned on.
B (center)	Fault LED (amber)	This LED is lit when a power fault occurred within the power supply.
C (right)	AC OK LED (green)	This LED is lit whenever the AC power cord is plugged in to an active AC power source.

Figure 32. Power Supply Indicators

Cautions:

- *Because of chassis airflow disruption, a power supply bay should never be vacant for more than two minutes when the server power is on. Exceeding five-minutes might cause the system to exceed the maximum acceptable temperature and possibly damage system components.*

1. Remove the AC power cord from the power supply to be removed.
2. Press down on the latch (green touch-point label) to release the power supply handle. See letter “A” in the figure below.
3. Open the handle on the power supply. See letter “B” in the figure.
4. Pull the power supply from the chassis and set it on a clean, ESD-protected work surface. See letter “C”.

Note: *Power supply redundancy is available if two power supplies are installed.*

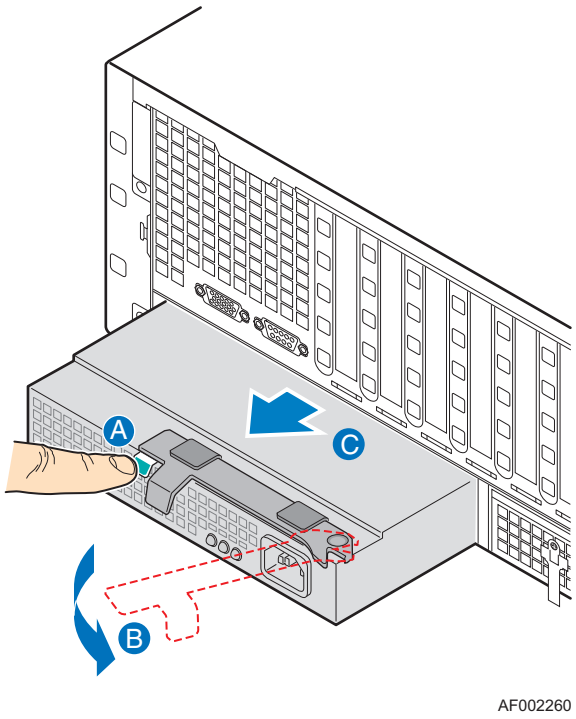


Figure 33. Removing a Power Supply

5. Remove the new power supply from the protective packaging and place it on a clean ESD protected work surface.
6. Record the model and serial numbers of the power supply in your equipment log.
7. Slide the new power supply partway into the power supply bay, with the AC inlet connector on the right side.
8. With the handle in the open position, push the power supply into the power supply fully into the bay until it stops. See letter “A” in the following figure.
9. Rotate the handle to the closed position until it clicks and is latched in place. See letter “B” in the figure.

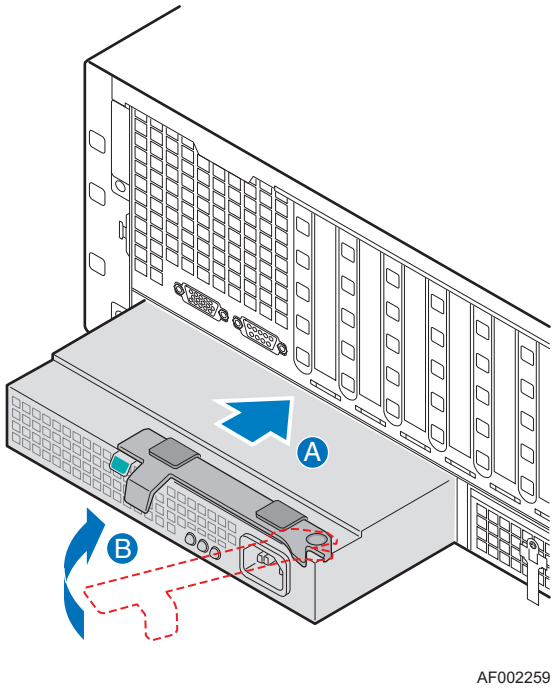


Figure 34. Installing a Power Supply

10. Plug the power cord into the AC receptacle on the power supply.
11. Use the LEDs on the power supply to confirm the power supply is functioning.

Installing and Removing PCI Express* Add-in Cards

Note: *Cards can be hot-swapped only in PCI slots 1 and 2. The server must be powered down to install or remove a card from PCI slots 3 through 7. When looking at the system from the front, slots 1 and 2 are at the right.*

Caution: *Expansion slot covers must be installed over all vacant slots to maintain the electromagnetic emission characteristics of the server and to ensure proper system cooling.*

Removing a Hot-swap PCI Card, Operating System Interface

Caution: *Only PCI add-in cards in PCI slots 1 and 2 are hot-swappable. If you are removing a PCI card in PCI slots 3 through 7, see ""Removing a Non-hot-swap PCI Card" on page 74. When looking at the system from the front, slots 1 and 2 are at the right.*

1. Remove the top cover. For instructions, see "Removing the Top Cover" on page 58.
2. If you are using a Microsoft Windows* operating system, double-click the "Unplug/Eject" icon in the task bar to open the Unplug or Eject Hardware menu.
3. Select the device to be removed and click "Stop".
4. Wait for the PCI slot power LED at the rear if the slot to turn off.
5. Disconnect any cables attached to the card.
6. Rotate the retention latch at the rear of the card slot into the up position. See letter "A" in the following figure.
7. If a full-length card is installed, press the blue plastic piece at the front of the card.
8. Pull up on the card to remove it. See letter "B" in the figure.

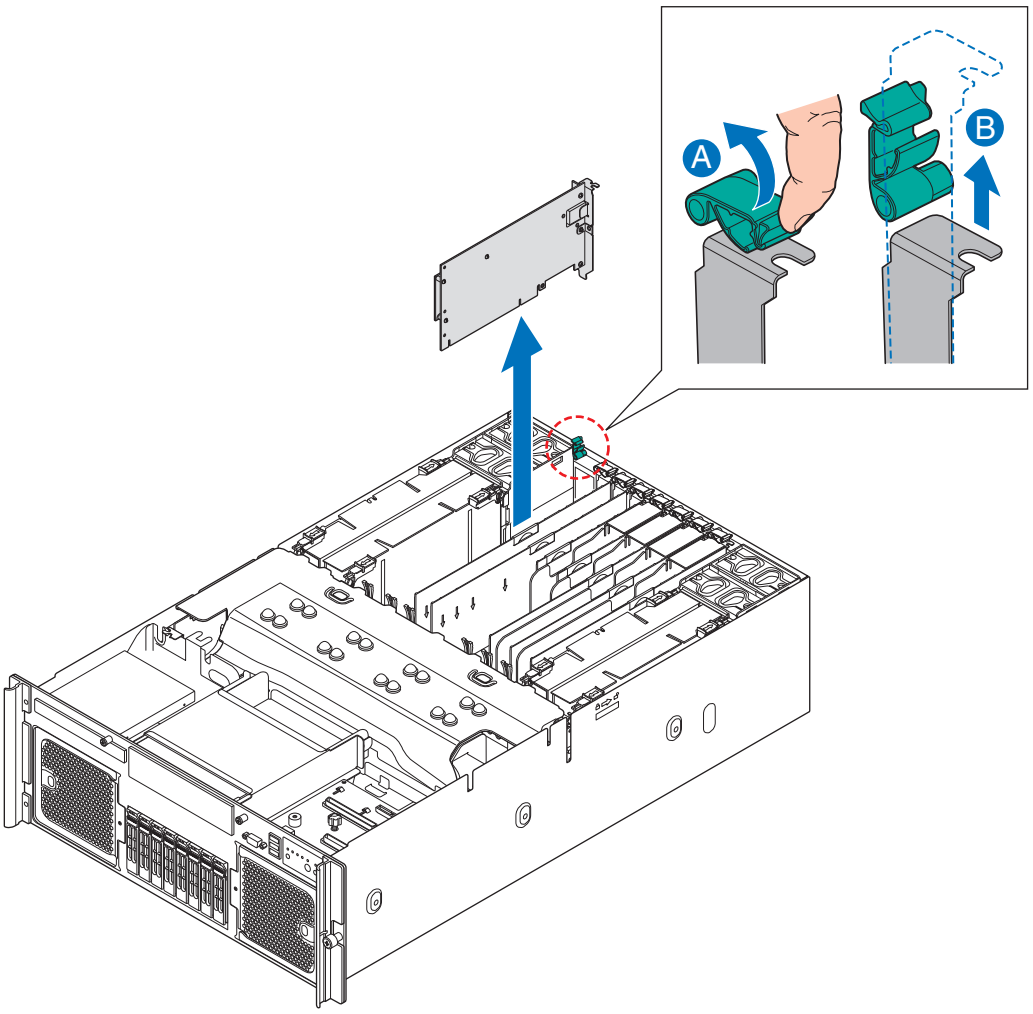


Figure 35. Removing a PCI Card

9. Store the card in an antistatic protective wrapper.
10. Install an expansion slot cover over the empty slot or install a replacement PCI card:
    - To install an expansion slot cover: align the cover with the slot from the rear of the chassis. Press the cover into the slot. Rotate the bracket at the rear of the card slot into the down position.
    - To install a replacement PCI card: see "Installing a Hot-swap PCI Card" on page 72.
11. Install the top cover. For instructions, see "Installing the Top Cover" on page 59.

Removing a Hot-swap PCI Card, Hardware Interface

Caution: *Only PCI add-in cards in PCI slots 1 and 2 can be hot-swapped. If you are adding or removing a PCI card from PCI slots 3 through 7, see "Removing a Non-hot-swap PCI Card" on page 74. When looking at the system from the front, slots 1 and 2 are at the right.*

1. Remove the top cover. For instructions, see "Removing the Top Cover" on page 58.
2. Press the attention button for the slot. See the following figure.

Note: *Press the attention button again within five seconds to abort the hot-plug operation.*

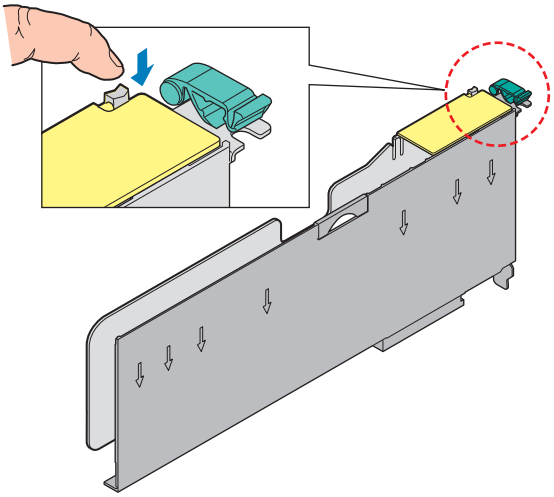


Figure 36. PCI Slot Attention Button

3. Wait for the power LED on the slot to turn off.
4. Disconnect any cables to the PCI card.
5. Rotate the retention latch at the rear of the card slot into the up position. See letter "A" in Figure 35 on page 70.
6. If a full-length card is installed, press the blue plastic piece at the front of the card.
7. Pull up on the card to remove it.
8. Store the card in an anti-static bag.
9. Install an expansion slot cover over the empty slot or install a replacement PCI card:

— To install an expansion slot cover: align the cover with the slot from the rear of the chassis. Press the cover into the slot. Rotate the retention latch at the rear of the board slot into the down position. See letter “C” in Figure 35 on page 70.

— To install a replacement PCI card: see “Installing a Hot-swap PCI Card” on page 72.

10. Install the top cover. For instructions see “Installing the Top Cover” on page 59.

Installing a Hot-swap PCI Card

Caution: *Only PCI add-in cards in PCI slots 1 and 2 are hot-swappable. If you are installing a PCI card into PCI slots 3 through 7, see “Installing a Non-hot-swap PCI Card” on page 75. When looking at the system from the front, slots 1 and 2 are at the right.*

1. If your server is operating, use your operating system or GUI application to power down the PCI slot.
2. Remove the top cover. For instructions, see “Removing the Top Cover” on page 58.
3. Being careful not to touch the components or gold edge-connectors on the add-in card, remove the card from the anti-static bag and place it on a clean, ESD-protected work surface.
4. Record the serial number of the board and any jumpers or switch settings according to the board manufacturer's instructions. Record these settings in your equipment log.
5. Rotate the retention latch at the rear of the card slot into the up position. See letter “A” in the following figure.
6. If an expansion slot cover is installed, remove it by sliding it up. See letter “B” in the figure.
7. Align and slide the adapter board down until it seats in its connector. If you are installing a full-length card, guide the front of the card into the slot shown by letter “D” in the figure.
8. Press the card down firmly until it seats into the slot.

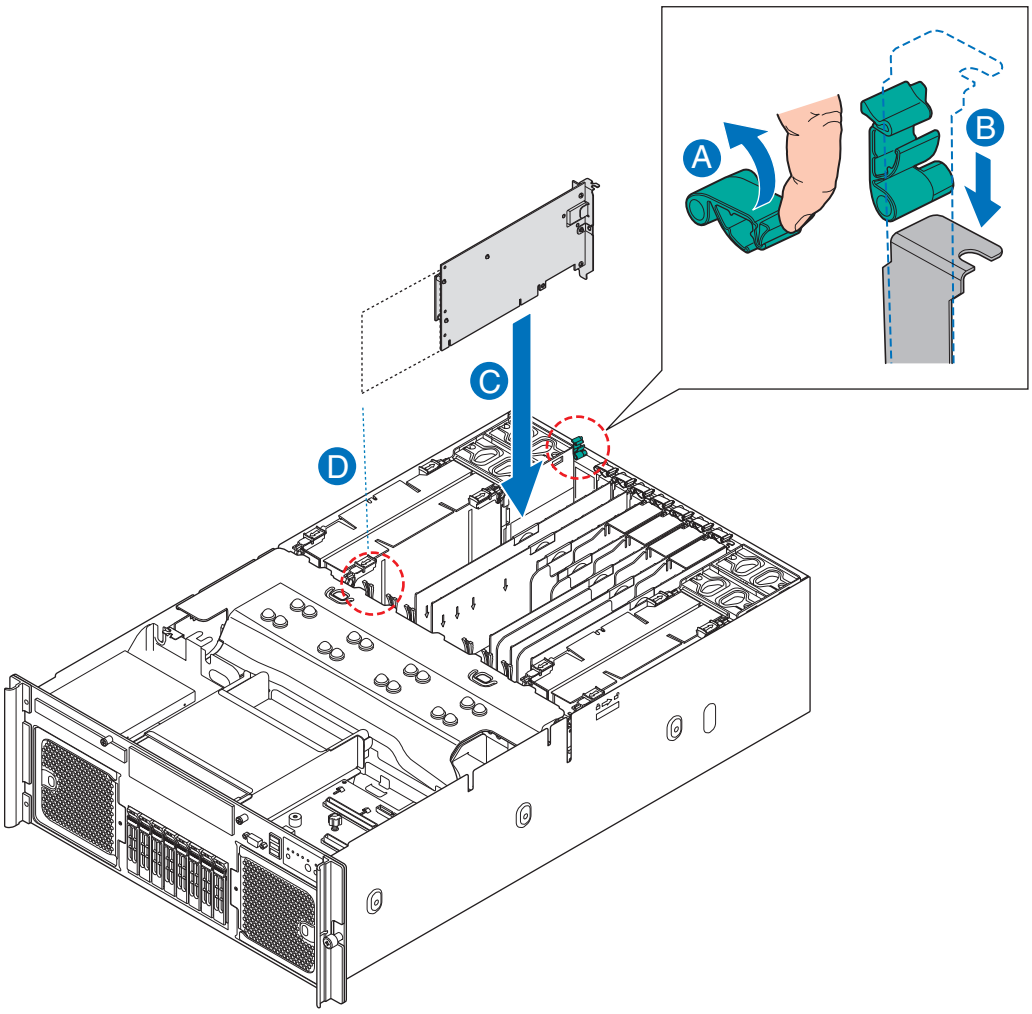


Figure 37. Installing a PCI Add-in Card

Caution: *Some accessory/option board outputs exceed Class 2 or limited power source limits. Use appropriate interconnecting cabling in accordance with the national electrical code.*

9. Rotate the retention latch at the rear of the card slot into the down position.
10. Connect any required cabling to the PCI add-in card.
11. If using the operating system hot-plug interface:
    - ✧ Wait for the software user interface to appear on your monitor and then confirm the device to be enabled.
    - ✧ Wait for the power LED to turn on.

If using the hardware hot-plug interface:

- ✧ Press the attention button for the slot. If you need to abort the hot-plug operation, press the attention button again within five seconds.
- ✧ Wait for power LED to turn on.

Note: *For either the operating system interface or the hardware hot-plug interface, if the attention LED is blinking, a power fault has occurred. You may need to remove the adapter, wait for the LED to turn off, and re-start the hot insertion.*

12. Install the top cover. For instructions, see "Installing the Top Cover" on page 59.

Removing a Non-hot-swap PCI Card

PCI cards in slots 1 and 2 can be hot-swapped. If you want to hot-swap a card in one of these slots, see "Removing a Hot-swap PCI Card, Operating System Interface" on page 69 or "Removing a Hot-swap PCI Card, Hardware Interface" on page 71.

Caution: *AC power must be removed from the system before servicing a non-hot-swap PCI card. You might damage your system if you do not power it down before removing or installing a card in slots 3 through 7. When looking at the system from the front, slots 3 through 7 are the five right slots.*

1. Remove the top cover. For instructions, see "Removing the Top Cover" on page 58.
2. Disconnect any cables attached to the PCI card.
3. Rotate the retention latch at the rear of the card slot into the up position. See letter "A" in Figure 35 on page 70.
4. Pull up on the card to remove it.
5. Place the PCI card on a clean, static-free work surface or inside a static-free plastic bag.
6. Install an expansion slot cover over the empty slot or install a replacement PCI card:
   - ✧ To install an expansion slot cover, align the cover with the slot from the rear of the chassis. Press the cover into the slot. Rotate the bracket at the rear of the chassis into the down position. See letter "C" in Figure 36.
   - ✧ To install a replacement PCI card, see "Installing a Hot-swap PCI Card", below.
7. Install the top cover. For instructions, see "Installing the Top Cover" on page 59.

Installing a Non-hot-swap PCI Card

PCI cards in slots 1 and 2 can be hot-swapped. If you want to hot-swap a card in one of these slots, see "Removing a Hot-swap PCI Card, Operating System Interface" on page 69 or "Removing a Hot-swap PCI Card, Hardware Interface" on page 71.

Caution: *AC power must be removed from the system before servicing a non-hot-swap PCI card. You might damage your system if you do not power it system before removing or installing a card in slots 3 through 7. When looking at the system from the front, slots 3 through 7 are the five right slots.*

1. Remove the top cover. For instructions, see "Removing the Top Cover" on page 58.
2. Being careful not to touch the components or the gold edge connectors on the PCI card, remove it from its protective wrapper. Place the card component-side up on a clean, static-free work surface.
3. Record the serial number of the PCI card in your equipment log.
4. Rotate the retention latch at the rear of the card slot into the up position. See letter "A" in "Installing a PCI Add-in Card" on page 73.
5. If necessary, remove the expansion slot cover in the slot you are using by sliding it up from inside the chassis. See letter "B" in "Installing a PCI Add-in Card" on page 73.
6. Align and slide the adapter board down until it seats in its connector. If you are installing a full-length card, guide the front of the card into the slot shown by letter "D" in "Installing a PCI Add-in Card" on page 73.
7. Press the card down firmly until it seats into the slot.
8. Rotate the retention latch at the rear of the card slot into the down position.
9. Attach any required cables to the PCI card.
10. Install the top cover. For instructions, see "Installing the Top Cover" on page 59.

Installing and Removing Memory Boards

At least one memory board and one DIMM must be installed for the server to function. Supported memory board configurations are as follows:

- One memory board installed in Slot A, at the right side of the system.
- Two memory boards, installed in Slots A and B, the two boards at the right side of the system
- All four memory boards, Slots A, B, C, and D

AC power must be removed from the system before servicing the memory boards.

Removing a Memory Board

1. Remove the top cover. For instructions, see “Removing the Top Cover” on page 58.
2. Rotate the latches on the memory board upward to disengage the memory board from the main board. See letters “A” and “B” in the following figure.

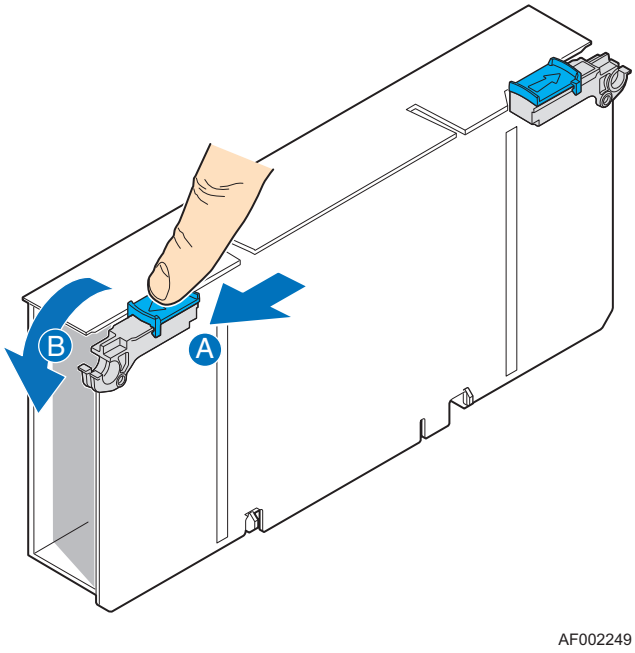


Figure 38. Opening Memory Board Latches

3. Lift the memory board by the latches to pull it from the server.

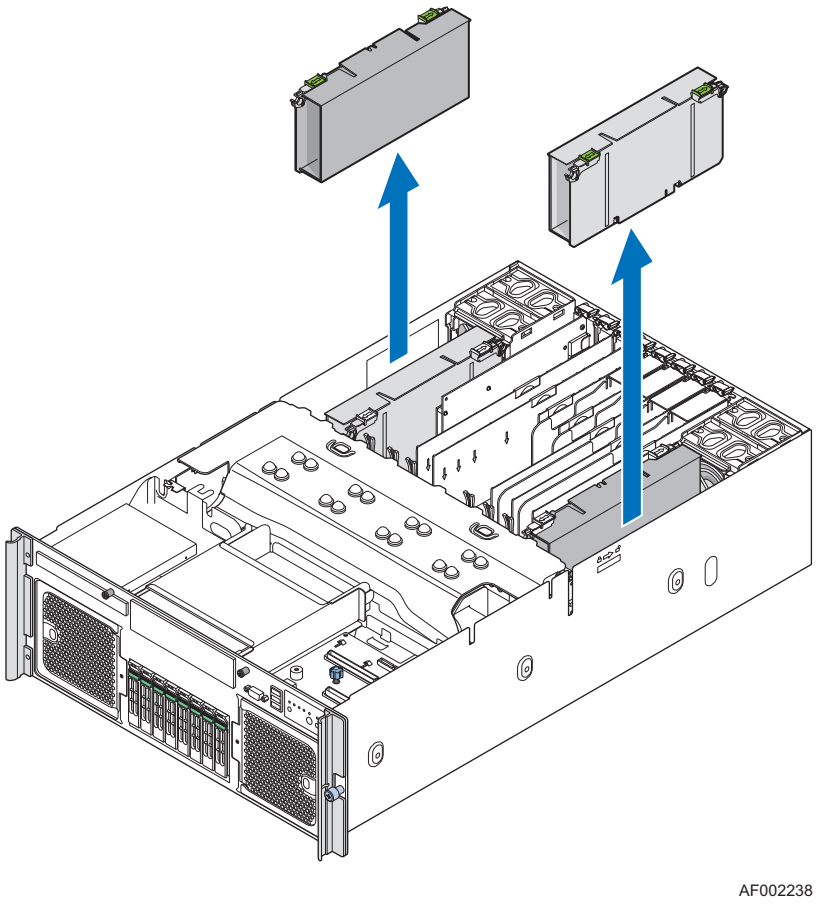


Figure 39. Removing a Memory Board

Installing a Memory Board

1. Ensure the latches on the memory board are in the open / up position.
2. Align the edges of the board in the card guides and slide the memory board into the main board.

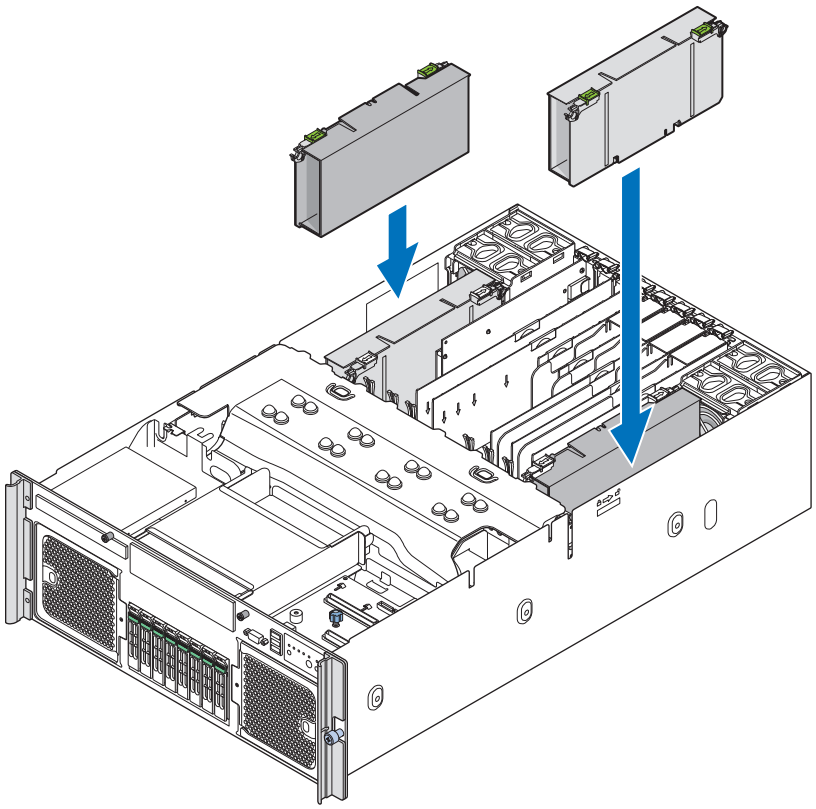


Figure 40. Installing a Memory Board

3. Once the board is lowered as far as possible, rotate the latches downward to firmly engage the board into the memory board slot.
4. Install the top cover. For instructions, see “Installing the Top Cover” on page 59.

Installing and Removing DIMMs

Memory Population Rules

- Memory must be populated beginning with memory board A, slot 1. This is DIMM Slot A1). Memory board A is at the right side of the system.
- To increase memory capacity, additional memory can be added to memory board A beginning with slot A2, and followed by slot A3 and then slot A4.
- To ensure proper system thermal performance, all DIMM slots must be populated with either a DIMM or a DIMM blank.

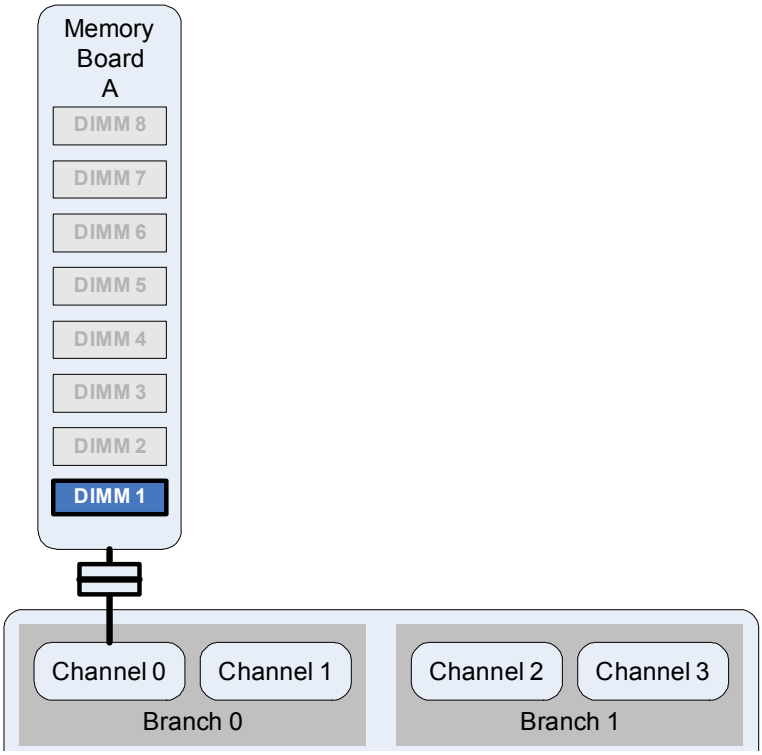


Figure 41. Minimum Memory Population

If only memory boards A and B are installed:

- Identically numbered FBDIMM sockets for both memory boards must be populated with FBDIMMs identical in terms of timing, technology, and size. For example, DIMM A1 and B1 must be identical.
- FBDIMMs installed in different socket positions (numbers) on a riser board do not need to be identical for dual-channel operation. For example, DIMMs A1 and B1 can be different from DIMMs A2 and B2.
- Additional memory can be added by installing identical pairs of DIMMs in the lowest numbered available slots.

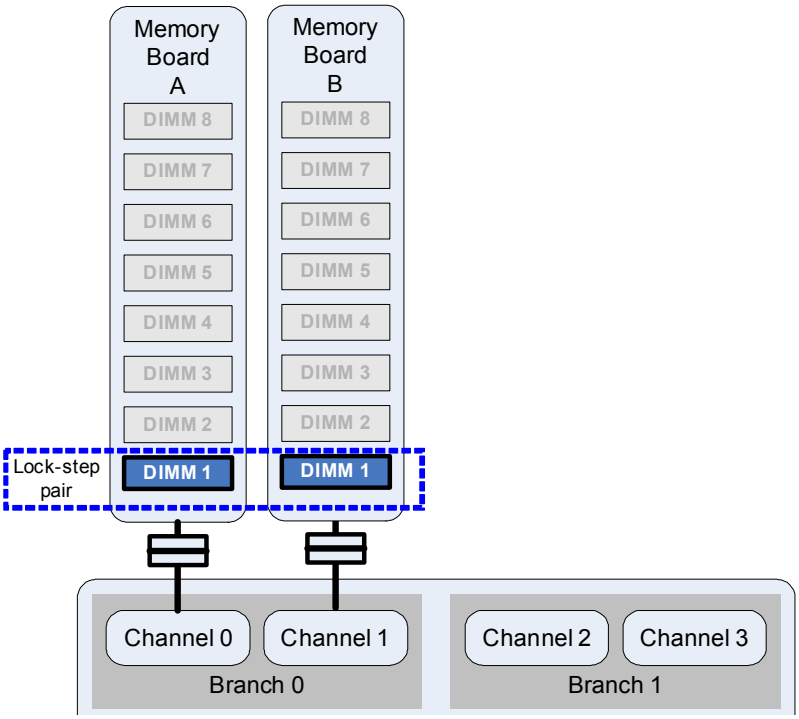


Figure 42. Memory Board A and B Population

If memory boards A, B, C and D are installed:

- Identically numbered FBDIMM sockets for both memory boards in a branch must be populated with FBDIMMs identical in terms of timing, technology, and size. For example, DIMM A1 and B1 must be identical, and DIMM C1 and D1 must be identical.
- FBDIMMs installed in different socket positions (numbers) on a memory board do not need to be identical. For example, DIMMs A1 and B1 can be different from DIMMs A2 and B2.
- If memory mirroring is not required, FBDIMMs installed in the same socket positions (numbers) across the two branches do not need to be identical. For example, DIMMs A1 and B1 can be different from DIMMs C1 and D1.
- If memory mirroring is required, FBDIMMs installed in the same socket positions (numbers) across the two branches must be identical. For example, DIMMs A1 and B1 must be identical to DIMMs C1 and D1.
- Additional memory can be added by installing identical pairs of DIMMs in the lowest numbered available slots.

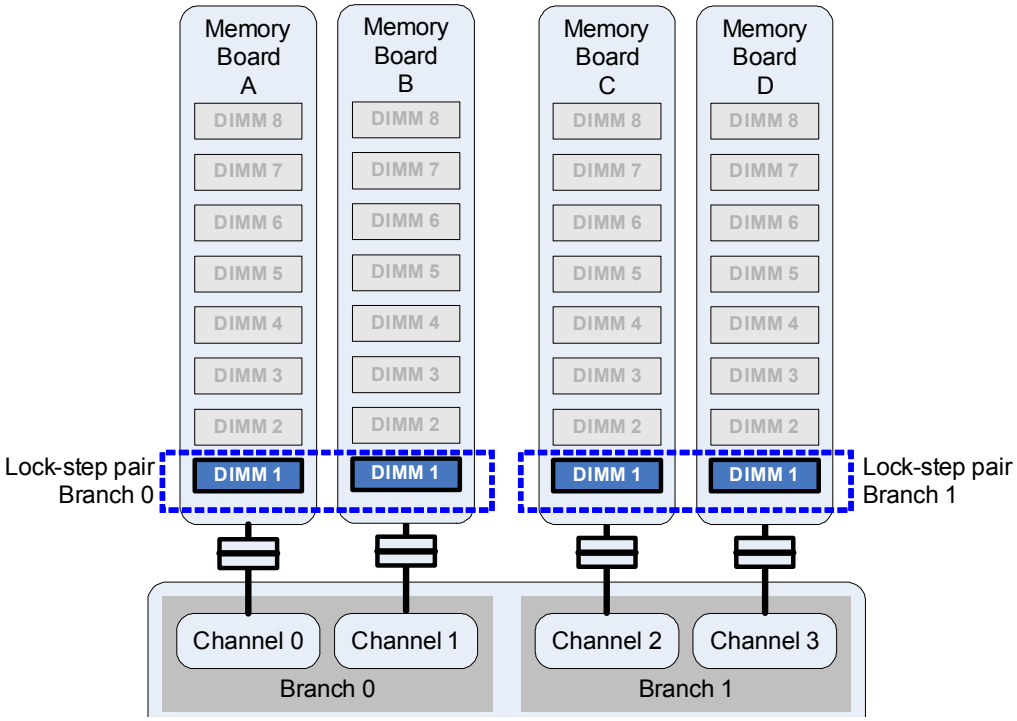


Figure 43. Memory Board A, B, C, D Population

Installing DIMMs

Cautions:

- *Use extreme care when installing a DIMM. Applying too much pressure can damage the connector. DIMMs are keyed and can be inserted in only one way.*
- *Hold DIMMs only by the edges. Do not touch the components or gold edge connectors.*
- *Install DIMMs with gold-plated edge connectors only.*
- *The maximum DIMM height is 4.445 cm (1.75 inches). Do not install DIMMs that exceed this height.*

1. Remove the top cover. For instructions, see "Removing the Top Cover" on page 58.
2. Remove the memory board. For instructions, see "Removing a Memory Board" on page 76.
3. Press down on the hooks on the underside of the memory board to disengage them. See letter "A" in the following figure.
4. Lift the memory board DIMM cover from the memory board.

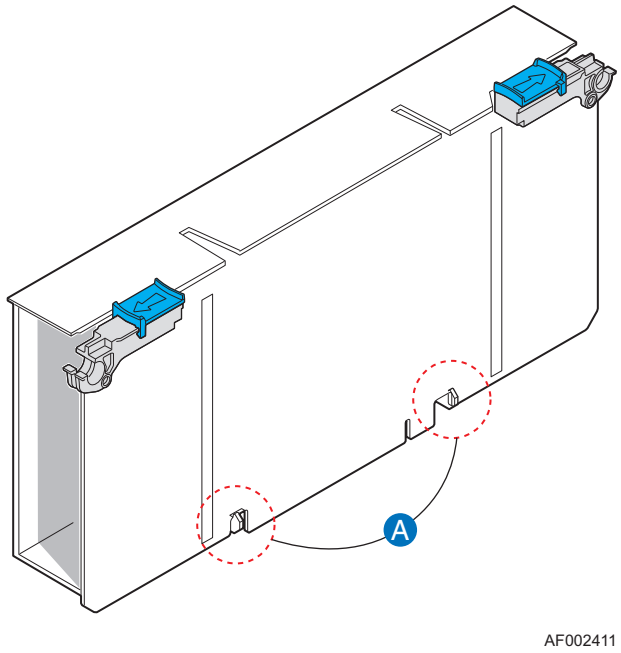


Figure 44. Remove Memory Board DIMM Cover

5. Open the plastic levers on each end of the DIMM socket(s). Remove the DIMM from its antistatic container. Hold the DIMM only by the edges. Do not touch the components or gold edge connectors.
6. Install DIMMs in the correct order. See “Memory Population Rules” on page 79.
7. Position the DIMM above the socket. Align the notch on the bottom edge of the DIMM with the key in the DIMM socket.
8. Insert the bottom edge of the DIMM into the socket.
9. Push down on the top edge of the DIMM. The levers at each end of the DIMM socket will close. Make sure the levers close securely.

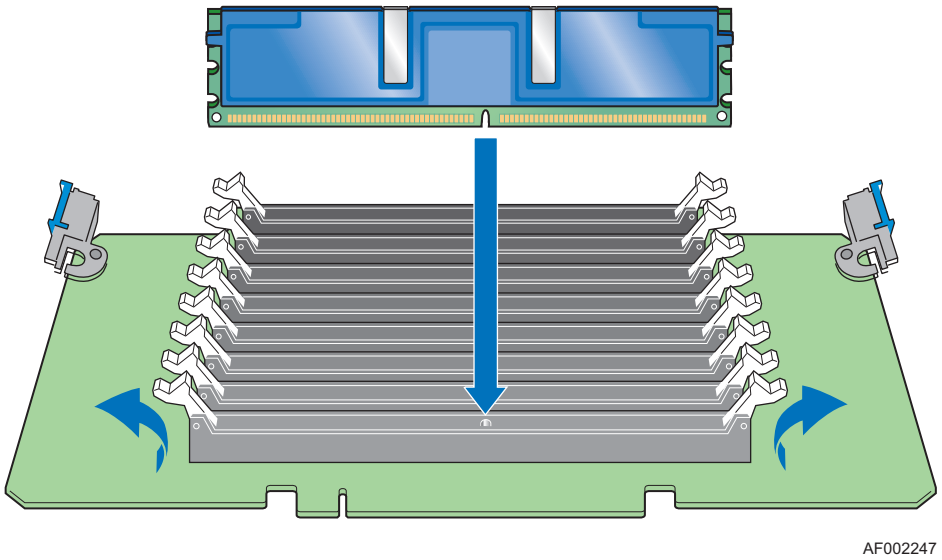


Figure 45. Install DIMMs

10. Lower the memory board DIMM cover over the DIMM slots.
11. Line up the hooks in the cover with the notches on the bottom edge of the memory board.
12. Press down on the cover until the hooks on both the top and bottom of the cover click into place around the memory board.
13. Install the memory board. For instructions, see “Installing a Memory Board” on page 78.

Removing DIMMs

Caution: *Use extreme care when removing DIMMs. Too much pressure can damage the connector. Apply only enough pressure on the plastic levers to release the DIMM.*

1. Remove the top cover. For instructions, see "Removing the Top Cover" on page 58.
2. Remove the memory board. For instructions, see "Removing a Memory Board" on page 76.
3. Press down on the hooks on the underside of the memory board to disengage them.
4. Lift the memory board DIMM cover from the memory board.
5. Open the plastic levers on each end of the DIMM socket(s). The DIMM will lift from the socket.
6. Hold the DIMM only by the edges. Do not touch the DIMM components or the gold edge connectors. Store it in an antistatic bag.
7. Install replacement DIMMs if necessary. For instructions, see "Installing DIMMs" on page 81.
8. Install the memory board. For instructions, see "Installing a Memory Board" on page 78.

6 Technician Maintenance

Note: *This chapter describes procedures that require internal server access. You must be a qualified service configuration technician to perform procedures listed in this chapter. To perform these procedures power down the server and remove all power cords from the server.*

Before You Begin

Before working with your server product, pay close attention to the "Safety Information" on page iii.

Use the equipment log to record the model and serial numbers of the server and all installed options.

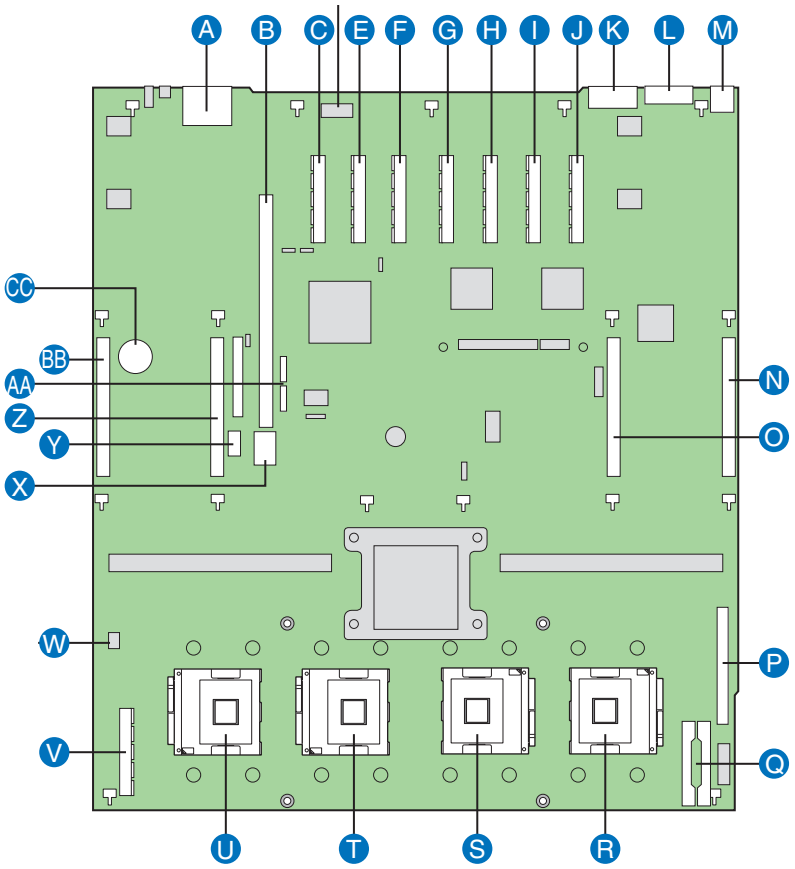
Tools and Supplies Needed

- Phillips* (cross-head) screwdriver, #2 bit
- Phillips screwdriver, #1 bit if installing the RAID battery backup unit
- Flat-head screwdriver
- Antistatic wrist strap and conductive foam pad (recommended)

System References

Unless otherwise noted, all references to left, right, front, top, and bottom assume you are facing the front of the chassis as it would be positioned for normal operation.

Component Locations

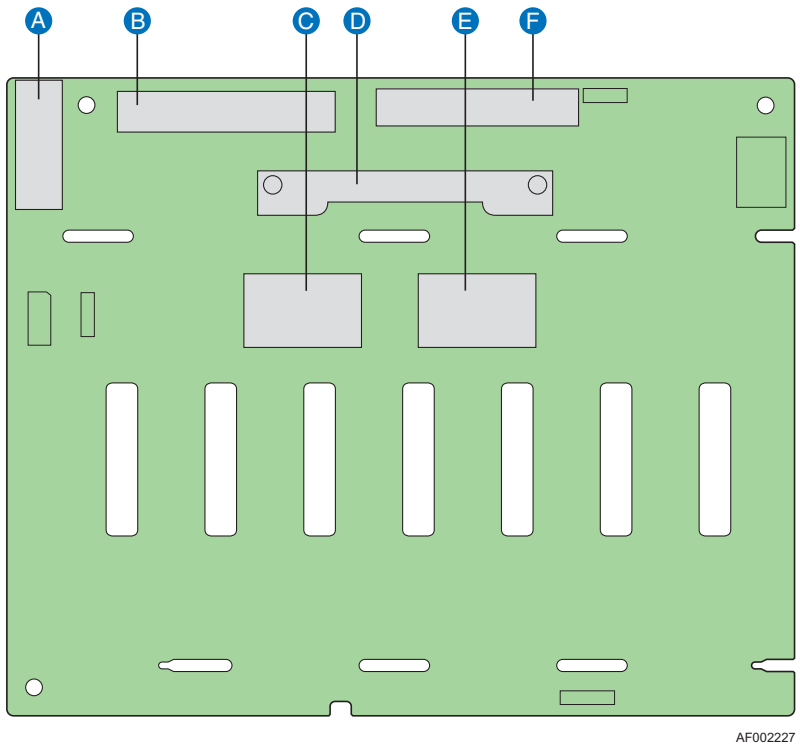


AF002275

Item	Description	Item	Description
A	Dual Ethernet ports	P	Front panel connector
B	I/O riser slot	Q	Power distribution board connectors (3)
C	PCI Express x4 (slot 7)	R	Processor socket 1
D	Serial Port A	S	Processor socket 2
E	PCI Express x4 (slot 6)	T	Processor socket 3
F	PCI Express x4 (slot 5)	U	Processor socket 4
G	PCI Express x8 (slot 4)	V	SAS riser slot
H	PCI Express x8 (slot 3)	W	Chassis intrusion
I	PCI Express x8 hot-plug (slot 2)	X	4-port SATA connector

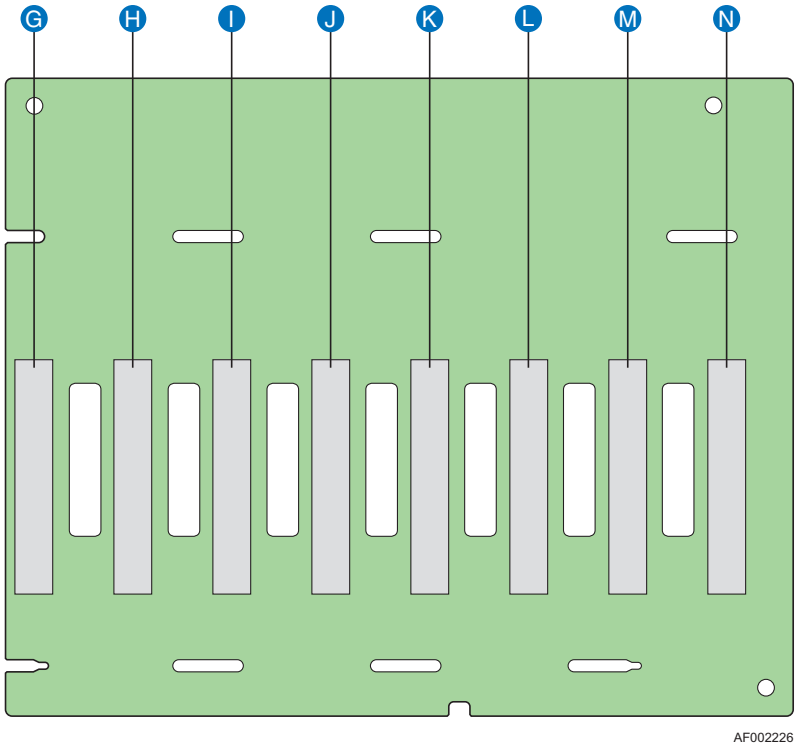
Item	Description	Item	Description
J	PCI Express x8 hot-plug (slot 1)	Y	Internal USB port
K	Serial port B	Z	Memory board (slot C)
L	Video port	AA	Single port SATA connectors
M	USB 1 (top), USB 2 (bottom)	BB	Memory board (slot D)
N	Memory board (slot A)	CC	Real-time clock battery
O	Memory board (slot B)		

Figure 46. Main Board Component Locations



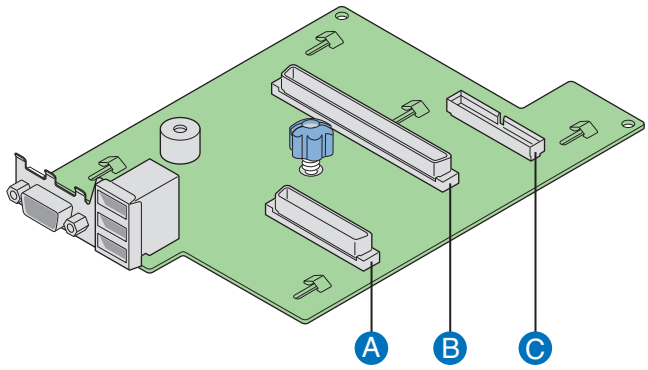
Item	Description
A	Power cable connector to CD-ROM / DVD-ROM drive and 5 ¼-inch peripheral
B	Hot-swap cooling fan connector
C	SAS x4 port B
D	Power distribution board connector
E	SAS x4 port A
F	Front panel board connector

Figure 47. SAS Backplane Connectors (Interior Side)



Item	Description
G	Hard Drive 0
H	Hard Drive 1
I	Hard Drive 2
J	Hard Drive 3
K	Hard Drive 4
L	Hard Drive 5
M	Hard Drive 6
N	Hard Drive 7

Figure 48. SAS Backplane Connectors (Drive Bay Side)



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Item	Description
A	Control panel connector
B	Main board connector
C	SAS backplane board connector

Figure 49. Front Panel Board Component Locations

Removing and Installing the Top Cover

Warning: *Make sure the rack is anchored securely so it will not tilt forward when the server is extended. A crush hazard exists if the rack tilts forward. This could cause serious injury.*

Cautions:

- *For proper cooling and airflow, do not operate the server with the cover removed. Do not leave the chassis cover open or a system fan removed any longer than necessary; system cooling could be reduced.*
- *The server comes with a removable top cover that allows the PCI cards, memory boards, and the system fans to be hot-swapped, and other system components to be serviced. Except for components described in this chapter, all servicing must be done by a qualified service technician.*
- *Provide electrostatic discharge (ESD) protection by wearing an antistatic wrist strap attached to chassis ground of the system-any unpainted metal surface-when handling components.*

Removing the Top Cover

1. No components in this chapter are hot-swappable. Before removing the chassis cover:
   - ✧ Turn off and disconnect all peripheral devices and cables connected to the outside of the server.
   - ✧ Power down the system by pressing and holding the power button on the front of the chassis for several seconds.
   - ✧ After the server shuts down, unplug both AC power cords to remove standby power from the system.
2. If the system is mounted in a rack, slide it out far enough to expose the entire top cover.
3. Unscrew the two captive screws on the faceplate. See letter “A” in the figure below.
4. Slide the top cover toward the rear until it stops, then lift the cover to remove it. See letter “B” in the figure.

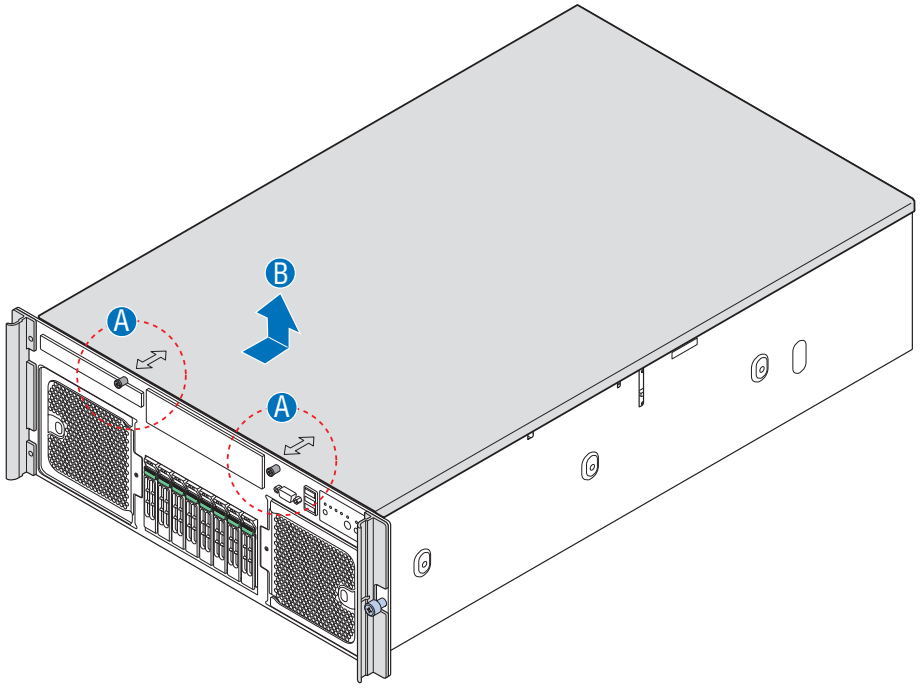

Figure 50. Removing the Top Cover

Installing the Top Cover

1. Place the cover over the chassis so that the side edges of the cover sit just inside the chassis sidewalls and the tabs on the cover align with the slots in the chassis.
2. Slide the cover forward until it clicks into place. See letter “A” in the figure below.
3. Tighten the captive screws on the faceplate. Use a torque setting of 0.90 N M (8 in lb). See letter “B” in the figure.
4. Reconnect all peripheral devices and the AC power cord.
5. Slide the system back into the rack.

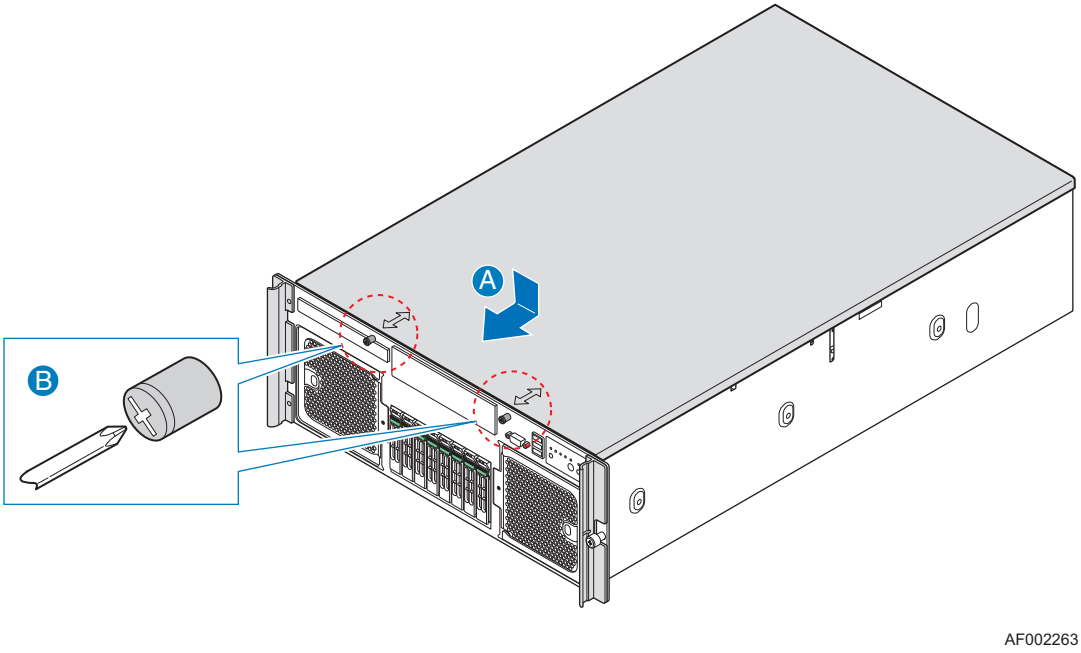

Figure 51. Installing the Top Cover

Removing and Installing the Processor Air Baffle

Removing the Processor Air Baffle

1. Remove the top cover. For instructions, see “Removing the Top Cover” on page 90.
2. Disconnect the 100-pin cable from the front panel I/O board. See letter “B” in Figure 49 on page 89 to locate the connection point.
3. Hang the end of the cable over the side of the chassis where it will be out of the way.
4. Disconnect any cables attached to the device in the 5 ¼-inch peripheral bay.
5. Push the 5 ¼-inch drive bay tray or peripheral out of the front of the chassis.
6. Insert fingers into the holes on top of the air baffle.
7. Pull the baffle up and back to disengage the baffle from the two sheet metal tabs at the front of the baffle. Lift the baffle up to remove it.

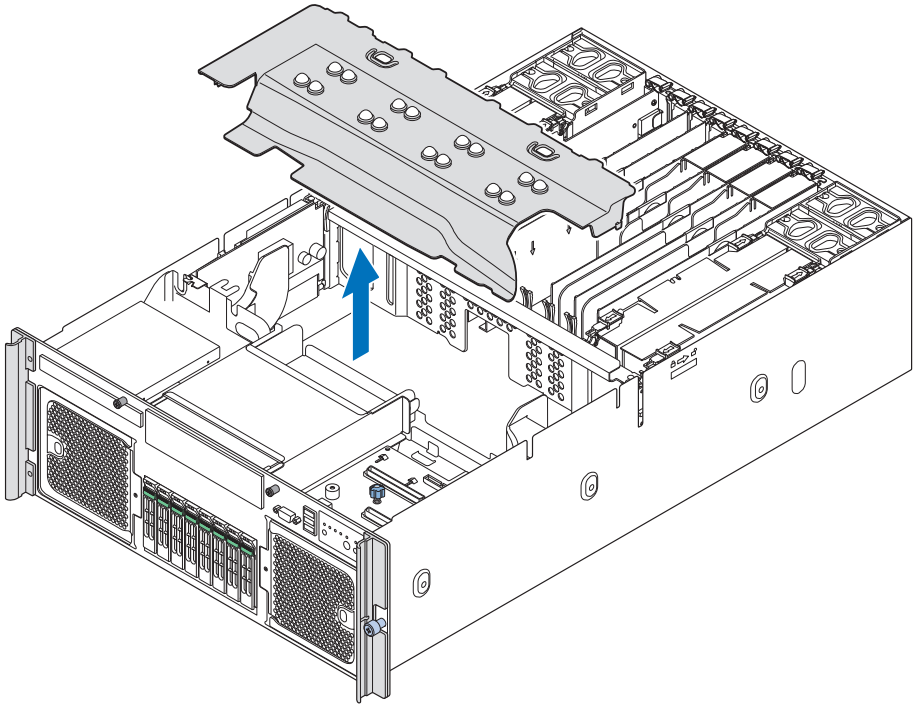

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Figure 52. Removing the Processor Air Baffle

Installing the Processor Air Baffle

1. Insert the front processor air baffle at an angle, front side first. See letter “A” in the following figure. Slide the tabs on the baffle under the sheet metal at the front of the baffle. One tab is located on each side of the chassis. See letter “B” in the figure.

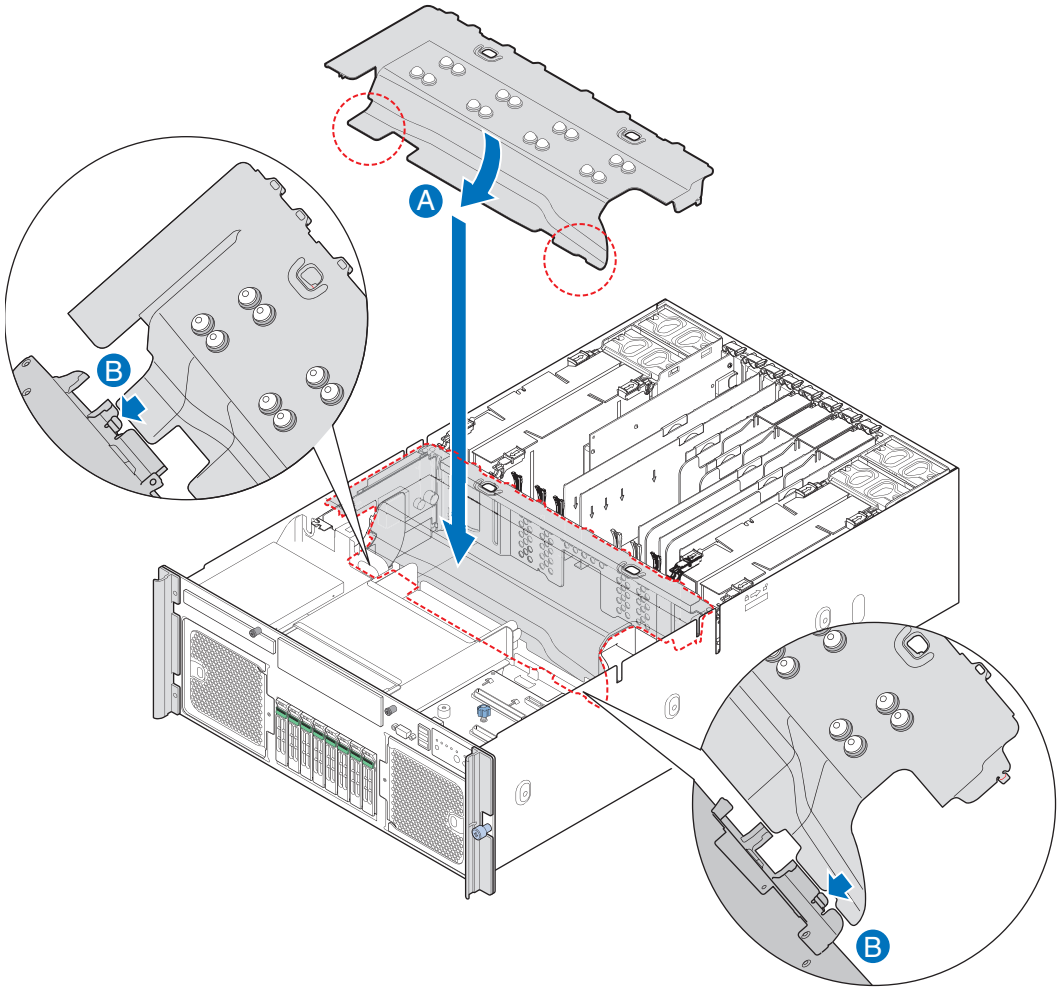


Figure 53. Installing the Processor Air Baffle

2. Lower the rear of the baffle into place, making sure the guides on each side of the air baffle (see letter “A” in the following figure) correctly engage in the left and right chassis slots. See letter “B”.

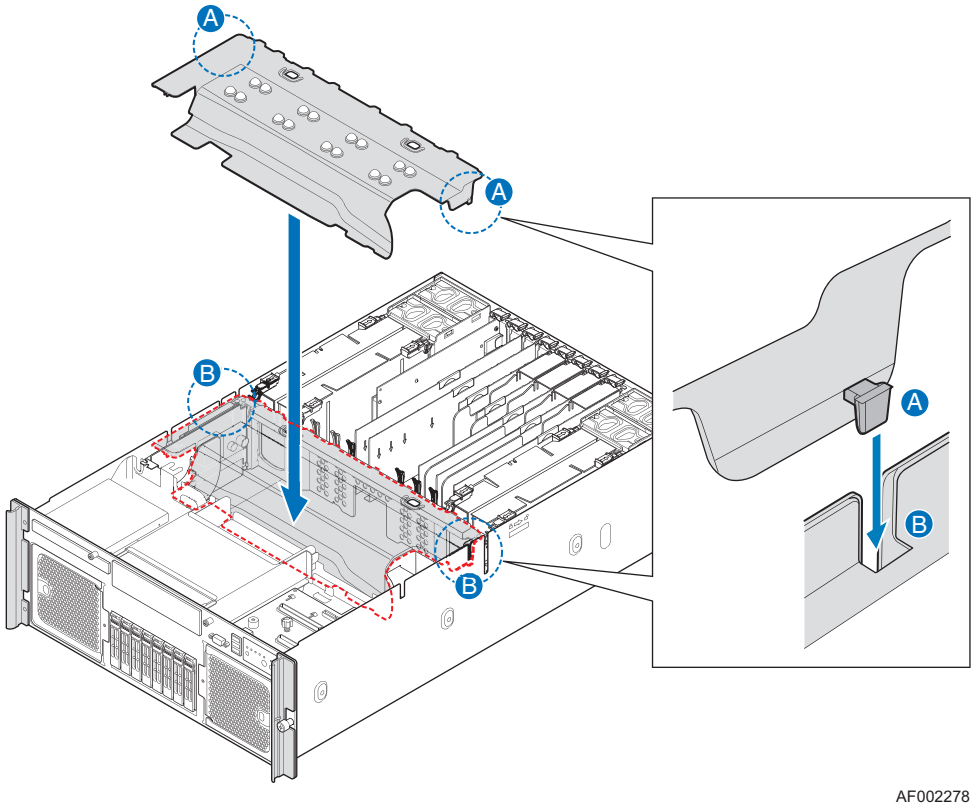


Figure 54. Engaging the Processor Air Baffle Guides

3. Press down gently on the air baffle to ensure it is fully seated.
4. Connect the 100-pin cable to the front panel I/O board. See letter “B” in Figure 49 on page 89 to locate the connection point.
5. Connect any necessary cables to the device in the 5 ¼-inch peripheral bay.

Removing and Installing the Lower Air Baffle

Removing the Lower Air Baffle

1. Remove the top cover. For instructions, see “Removing the Top Cover” on page 90.
2. Remove the processor air baffle. For instructions, see “Removing the Processor Air Baffle” on page 92.
3. Pull up on the lower air baffle to remove it.

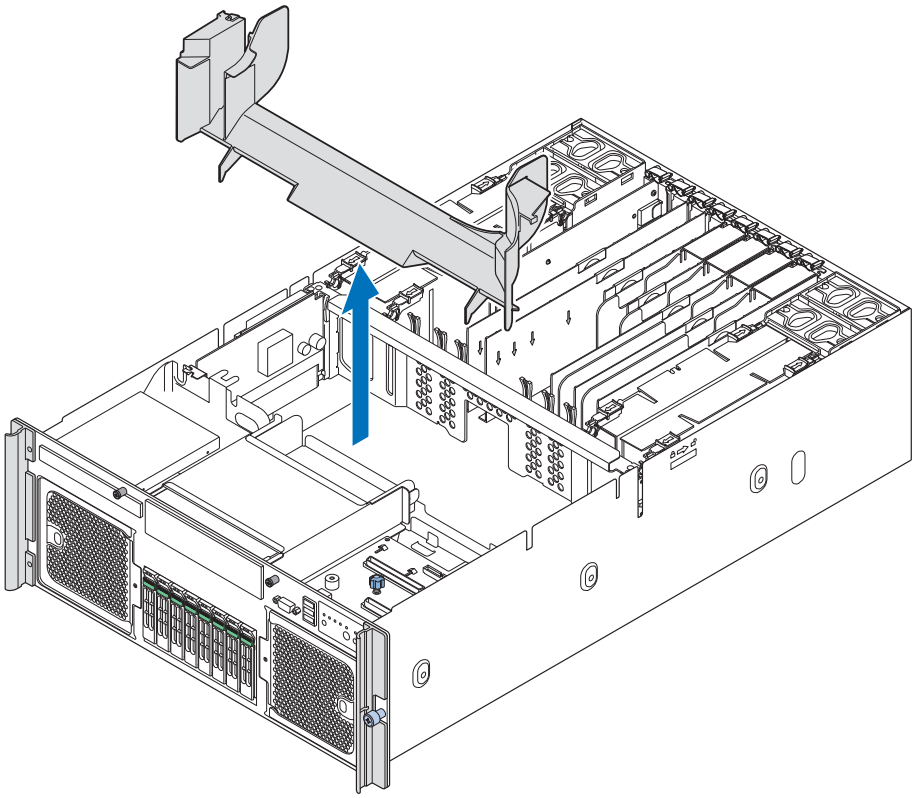


Figure 55. Removing the Lower Center Air Baffle

Installing the Lower Air Baffle

1. Lower the baffle into place, lining up the tabs at the sides of the baffle with the slots in the chassis and lining up the two tabs at the bottom of the air baffle with the matching holes in the bottom of the chassis.

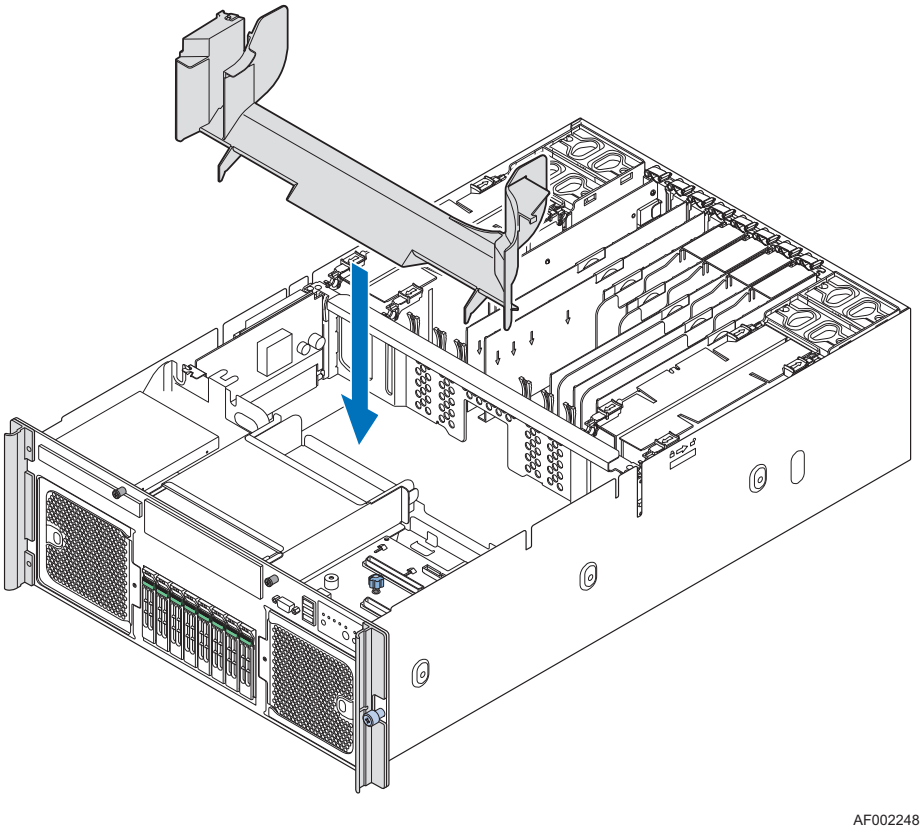


Figure 56. Installing the Lower Center Air Baffle

Installing and Removing the SAS Riser Board (optional)

The optional SAS riser board provides support for up to eight internal SAS hard drives. The SAS riser board supports RAID levels 0, 1, 1a, and 10 without any additional components (Integrated RAID mode). With the addition of the Intel® RAID Activation Key and a RAID DIMM, enhanced RAID capability and support for RAID levels 0, 1, 1a, 5, 6, 10, 50, and 60 are enabled.

Installing the SAS Riser Board

1. Remove the top cover. For instructions, see "Removing the Top Cover" on page 90.
2. Remove the processor air baffle. For instructions, see "Removing the Processor Air Baffle" on page 92.
3. Lower the SAS riser board into the SAS riser slot, ensuring that the edge of the card is inside of the slot divider. See letter "A" in the following figure.
4. Press down on the card until the metal bracket on the card is flush with the chassis (see letter "B") and locks into place (see letter "C").

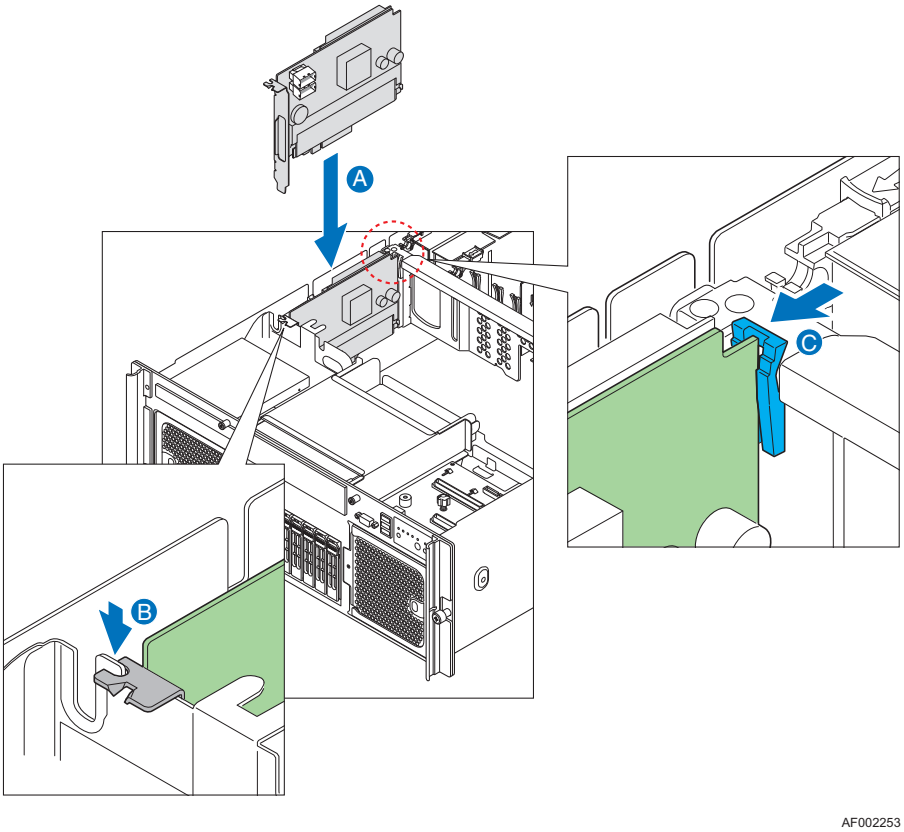


Figure 57. Installing SAS Riser Board

5. Connect the SAS riser cables, ensuring that the cables connect to the correct ports on the SAS backplane and SAS riser. The SAS backplane port furthest from the DVD-ROM drive needs to be connected to the lower SAS riser port (letter “A” in the following figure). The SAS backplane port closest to the DVD-ROM drive should be connected to the upper SAS riser port (letter “B” in the figure).

Caution: *If the cables are connected to the wrong ports, you may observe hard drive functionality issues and / or fault indications.*

6. Connect the SES cable to the SAS riser. See letter “C”.

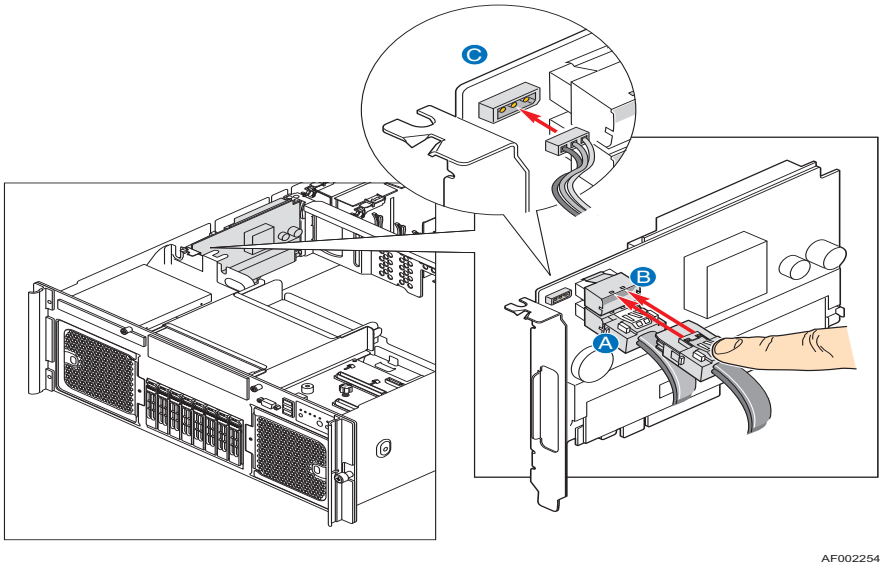


Figure 58. Connecting SAS and SES Cables to SAS Riser Board

7. Install the processor air baffle. For instructions, see “Installing the Processor Air Baffle” on page 94.
8. Install the top cover. For instructions, see “Installing the Top Cover” on page 91.

Removing the SAS Riser Board

1. Remove the top cover. For instructions, see “Removing the Top Cover” on page 90.
2. Remove the processor air baffle. For instructions, see “Removing the Processor Air Baffle” on page 92.
3. Remove the two SAS cables from the SAS riser board by pressing on the top of the cable connector and pulling the cable from the SAS port. See the following figure.
4. Remove the SES cable from the SAS riser board.

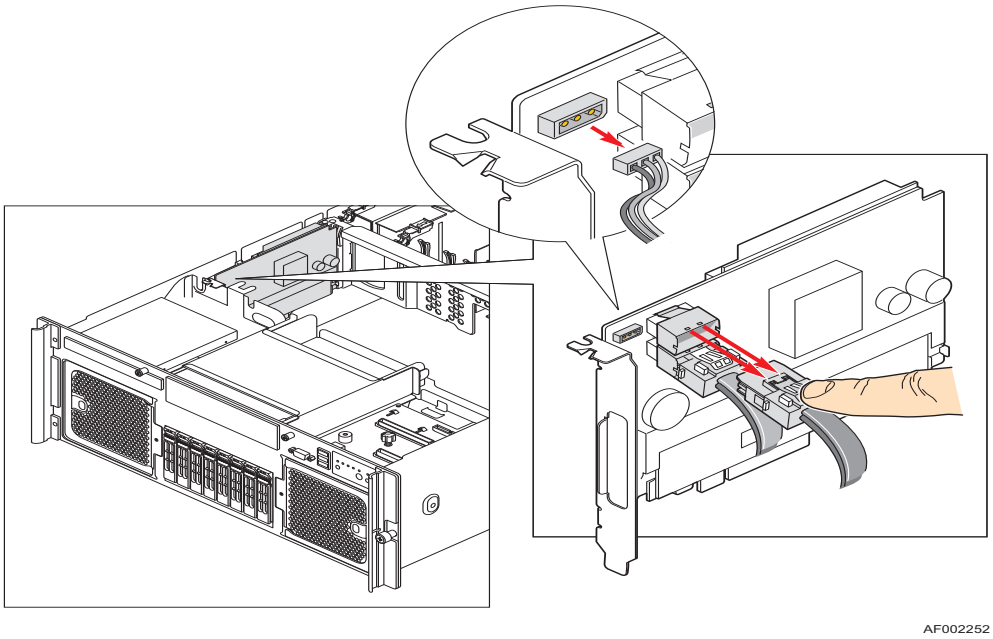


Figure 59. Disconnecting SAS and SES Cables from SAS Riser Board

5. Push back the slot divider's latch. While pushing back on the latch, pull up on the SAS riser board to remove it.

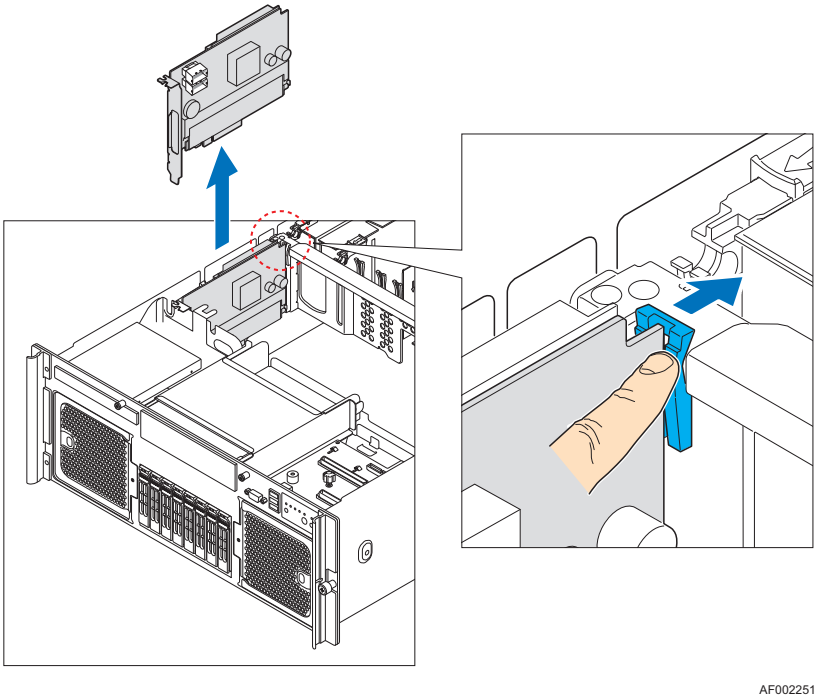


Figure 60. Removing SAS Riser Board

6. Install the processor air baffle. For instructions, see “Installing the Processor Air Baffle” on page 94.
7. Install the top cover. For instructions, see “Installing the Top Cover” on page 91.

Installing and Removing the Intel® RAID Activation Key and RAID DIMM

The optional Intel® RAID Activation Key and RAID DIMM enables enhanced RAID functionality on the SAS riser board. The DIMM serves as memory for the SAS controller, and as a disk cache to store write data to the drives. The DIMM must be a 256 MB or 512 MB DDR2-667 DIMM.

Installing the Intel® RAID Activation Key and RAID DIMM

1. Remove the top cover. For instructions, see “Removing the Top Cover” on page 90.
2. Remove the processor air baffle. For instructions, see “Removing the Processor Air Baffle” on page 92.
3. Remove the SAS riser board. For instructions, see “Removing the SAS Riser Board” on page 99.
4. Remove the Intel® RAID Activation Key from its package.
5. Insert the Intel® RAID Activation Key into the socket on the SAS riser board and push it into the socket until it is below the two retaining clips. See letter “A” in the following figure.
6. Make sure the clips at either end of the DIMM socket(s) are pushed outward to the open position. See letter “B” in the figure.
7. Holding the DIMM by the edges, remove it from its anti-static package.
8. Position the DIMM below the socket. Align the notch on the bottom edge of the DIMM with the key in the DIMM socket.
9. Insert the bottom edge of the DIMM into the socket.
10. When the DIMM is inserted, push down on the top edge of the DIMM until the retaining clips snap into place. Make sure the clips are firmly in place. See letter “C” in the figure.

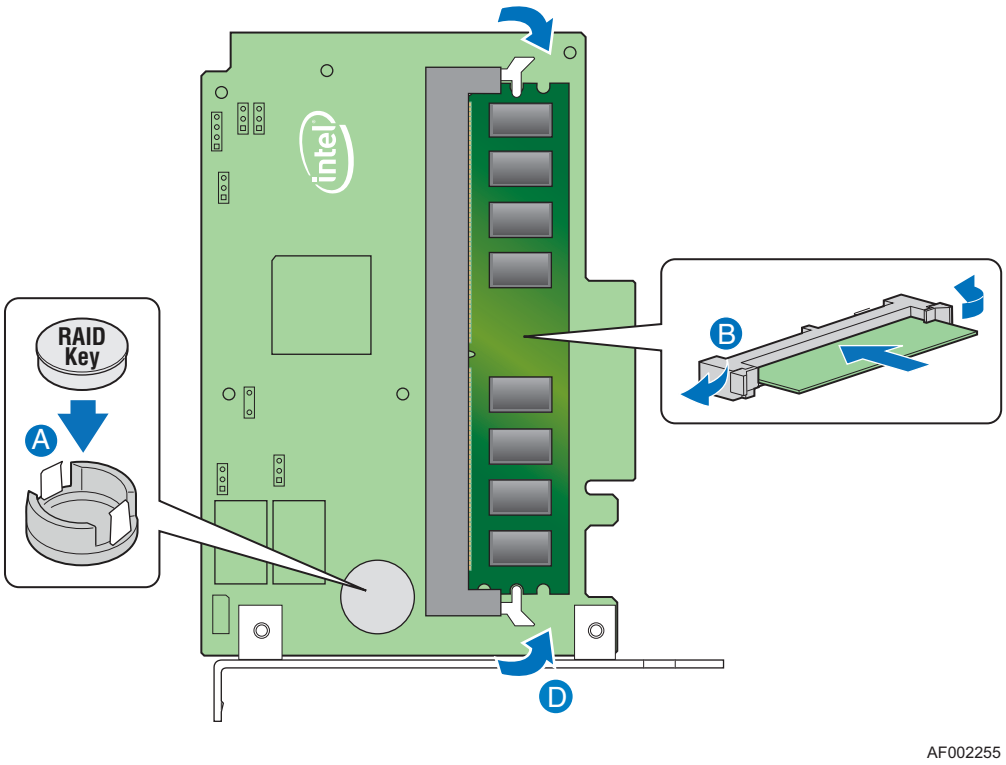


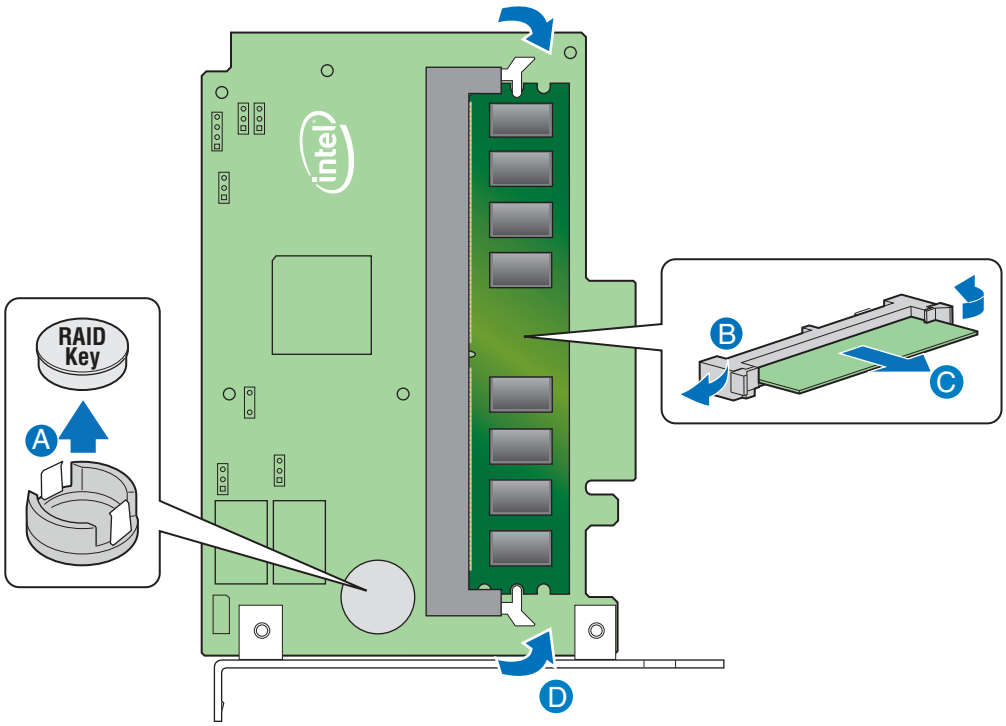
Figure 61. Installing the Intel® RAID Activation Key and DIMM

11. Install the SAS riser board. For instructions, see "Installing the SAS Riser Board" on page 98.
12. Install the processor air baffle. For instructions, see "Installing the Processor Air Baffle" on page 94.
13. Install the top cover. For instructions, see "Installing the Top Cover" on page 91.

Removing the Intel® RAID Activation Key and RAID DIMM

1. Remove the top cover. For instructions, see "Removing the Top Cover" on page 90.
2. Remove the processor air baffle. For instructions, see "Removing the Processor Air Baffle" on page 92.
3. Remove the SAS riser board. For instructions, see "Removing the SAS Riser Board" on page 99.
4. Pull back the two retaining clips of the Intel® RAID Activation Key socket and pull up on the RAID activation key to remove it. See letter "A" in the following figure.
5. Store the Intel® RAID Activation Key in an anti-static bag.

6. Gently spread the retaining clips at each end of the RAID DIMM socket. The DIMM lifts from the socket. See letter “B” in the figure.”
7. Holding the DIMM by the edges, lift it from the socket, and store it in an anti-static package. See letter “C”.
8. Push the DIMM latches to the closed position. See letter “D”.



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9. Install the SAS riser board. For instructions, see “Installing the SAS Riser Board” on page 98.
10. Install the processor air baffle. For instructions, see “Installing the Processor Air Baffle” on page 94.
11. Install the top cover. For instructions, see “Installing the Top Cover” on page 91.

Installing and Removing the Intel® RAID Smart Battery AXXRSBBU4

An optional DDR2-667 DIMM is used as memory for the SAS controller, and as a disk cache to store write data to the drives. If power to the SAS controller drops below specifications, the optional Intel® RAID Smart Battery AXXRSBBU4 battery back-up unit maintains the contents of the DIMM by keeping the DIMM in self-refresh mode until power is restored. After power is restored, the data is safely written to the drives, maintaining the integrity of the disk array.

For installation instructions, see the *Intel® RAID Smart Battery AXXRSBBU4 User's Guide* that came with your Smart Battery kit or on your *Intel® Server Deployment Toolkit CD 2*.

Installing and Removing the CD-ROM / DVD-ROM Drive

The server system accommodates one DVD-ROM / CD-ROM drive. The device is not hot-swappable, so the system must be powered down and the power cords removed from the chassis before installing or removing this drive.

Removing the CD-ROM / DVD-ROM Drive

1. Remove the top cover. For instructions, see "Removing the Top Cover" on page 90.
2. Disconnect the SATA and power cable from the SATA-to-IDE converter board at the rear of the CD-ROM / DVD-ROM. See letter "A" in the following figure.
3. Press the blue release latch on the CD-ROM / DVD-ROM carrier. See letter "B" in the figure.
4. Slide the CD-ROM / DVD-ROM from the front opening in the faceplate of the system. See letter "C".

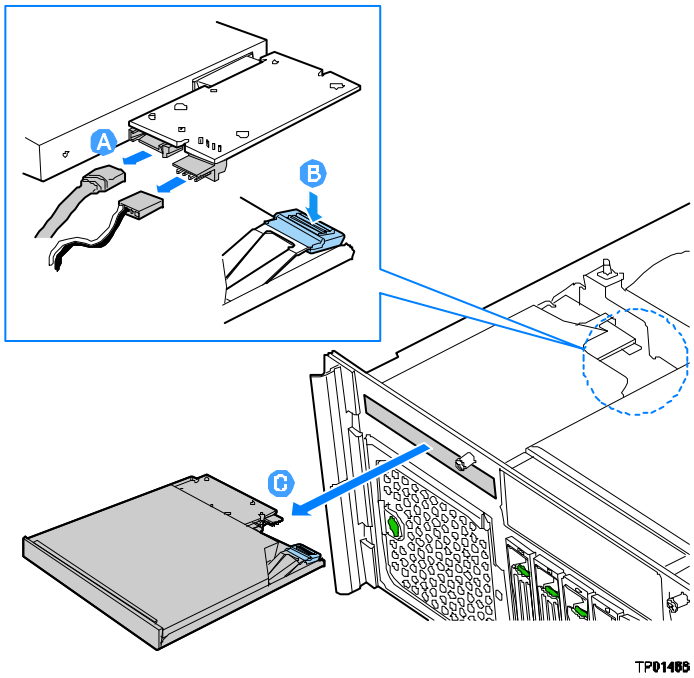


Figure 62. Removing the CD-ROM / DVD-ROM Drive Carrier from the Server

5. Lift up on the rear right corner of the CD-ROM / DVD-ROM to remove it from the carrier. See letters “A” and “B” in the following figure.
6. Pull out on the SATA-to-IDE converter board to remove it. See letter “C” in the figure.

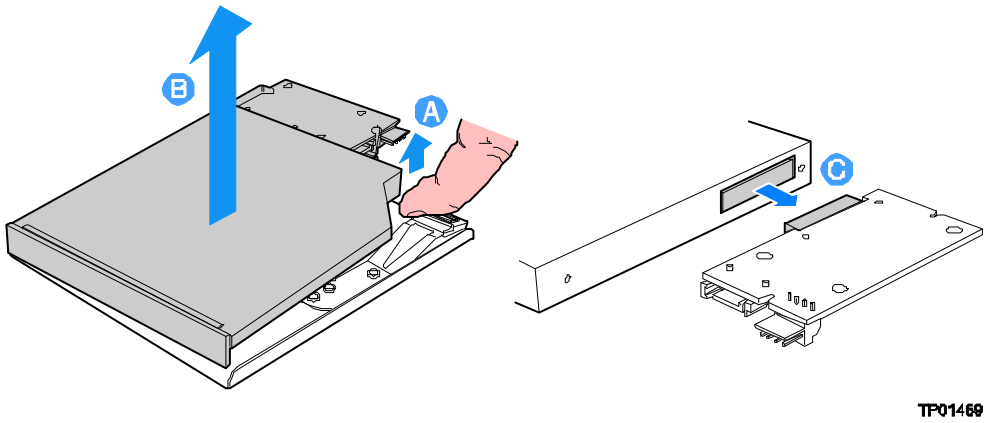


Figure 63. Removing the CD-ROM / DVD-ROM Drive from the Carrier

7. Store the drive in an antistatic protective wrapper or in its original packaging.

8. Install a new CD-ROM / DVD-ROM drive into the carrier or slide the empty carrier into the server.
9. Install the top cover. For instructions, see “Installing the Top Cover” on page 91.

Installing a CD-ROM / DVD-ROM Drive

1. Remove the top cover. For instructions, see “Removing the Top Cover” on page 90.
2. Remove the new drive from its protective wrapper, and place it component-side down on a clean ESD-protected work surface.
3. Record the drive model and serial numbers in your equipment log.
4. Attach the SATA-to-IDE converter board to the CD-ROM / DVD-ROM drive. See letter “A” in the following figure.
5. Place the left side of the drive into the drive carrier as shown in the following figure. See letter “B” in the figure.
6. Press the CD-ROM / DVD-ROM drive into the carrier until it is firmly secured. See letter “C”.

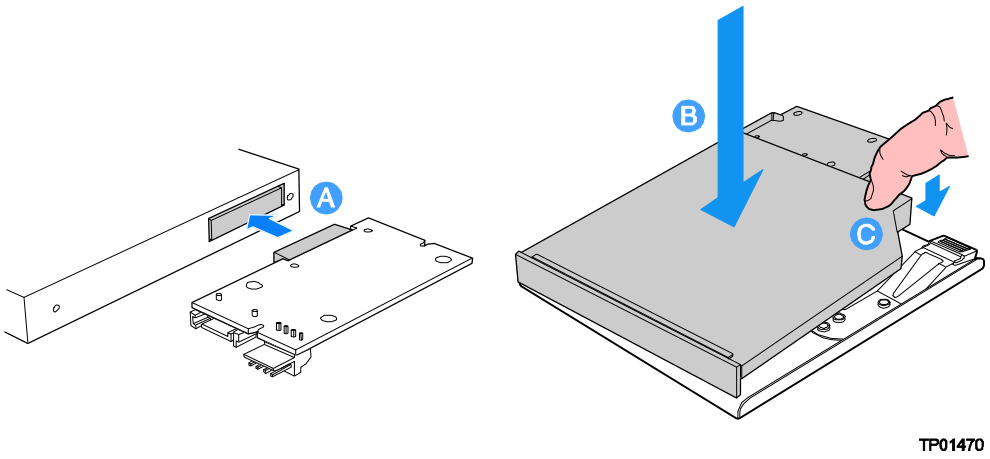


Figure 64. Assembling the CD-ROM / DVD-ROM Drive and Carrier

7. Insert the CD-ROM / DVD-ROM drive carrier assembly into the front opening in the chassis. See letter “A” in the following figure.
8. Plug the SATA cable and power cable into the converter board. See letter “B” in the figure.
9. Install the top cover. For instructions, see “Installing the Top Cover” on page 91.

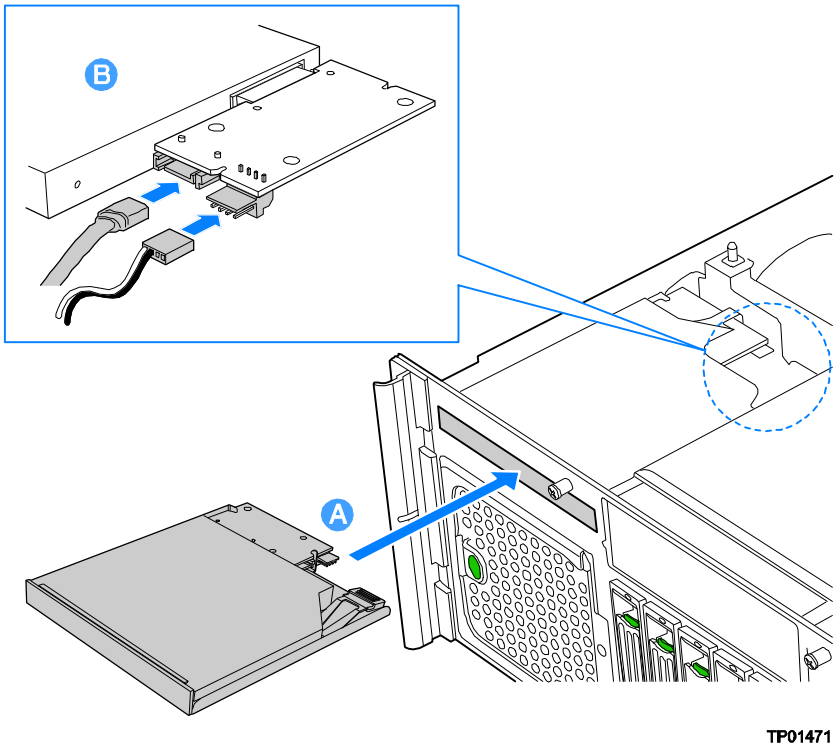


Figure 65. Inserting the CD-ROM / DVD-ROM Drive Carrier into the System

Installing and Removing a 5 ¼-inch Peripheral Device

The server system accommodates one 5 ¼-inch peripheral device. To install or remove this device, the system must be powered down and the power cords removed.

Installing a 5 ¼-inch Peripheral Device

1. Remove the top cover. For instructions, see “Removing the Top Cover” on page 90.
2. Push the tabs at each side of the peripheral device. See letter “A” in the following figure.
3. Hold the tabs in while pulling the peripheral device from the bay. See letter “B” in the figure.

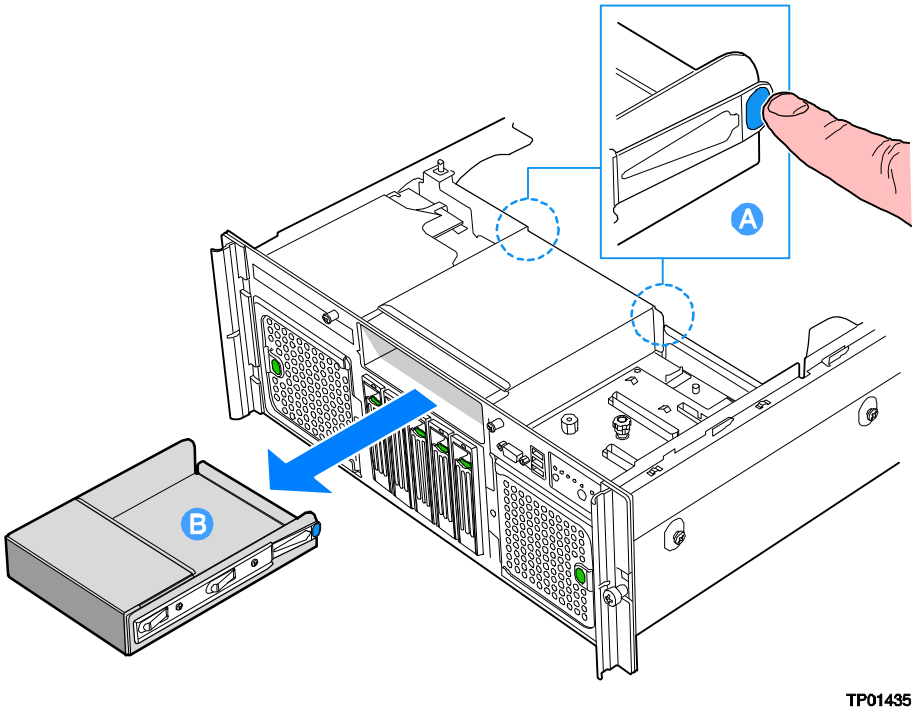


Figure 66. Removing 5 ¼-inch Peripheral Device from Server

4. Remove the screws that attach the slide rails to the filler panel.
5. Attach the slide rails to the device using the screws removed from the filler panel.
6. Pull the Y-power cable through the 5 ¼-inch peripheral opening.
7. Attach the Y-cable to the 5 ¼-inch peripheral.
8. Slide the 5 ¼-inch peripheral device into the server until it clicks into place. See the following figure.
9. Install the top cover. For instructions, see “Installing the Top Cover” on page 91.

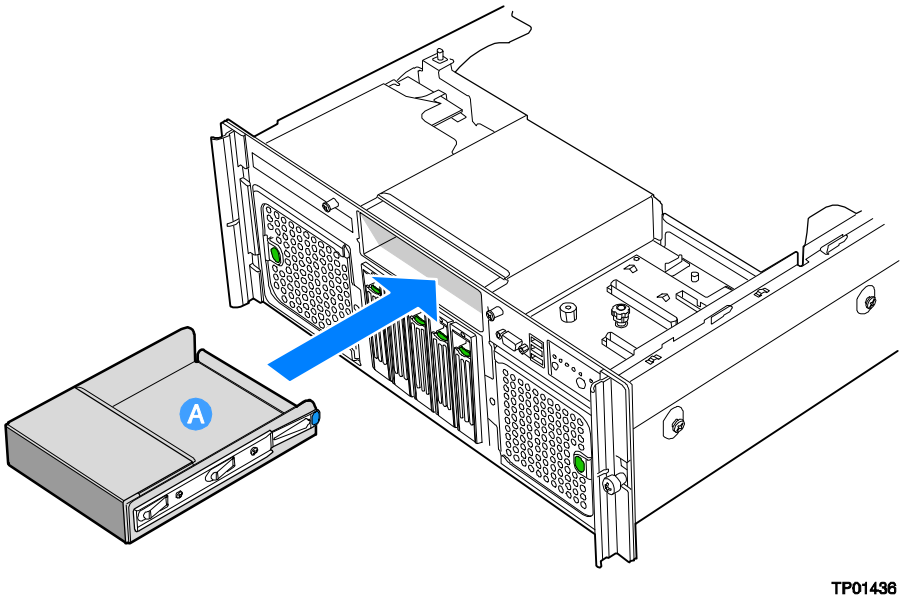


Figure 67. Installing 5 ¼ Peripheral Device into Server

Removing a 5 ¼-inch Peripheral Device

1. Remove the top cover. For instructions, see “Removing the Top Cover” on page 90.
2. Push the tabs at each side of the peripheral device. See letter “A” in Figure 66 on page 108.
3. Hold the tabs in while pulling the peripheral device from the bay. See letter “B” in Figure 66.
4. Disconnect the power cable at the rear of the device.
5. Unscrew the slide rails from the 5 ¼-inch peripheral device.
6. Install the slide rails on the replacement device or install them on the 5 ¼-inch filler panel that came with your server.
7. If installing a replacement device, attach the Y-power cable to the device.
8. Slide the device or filler panel into the 5 ¼ bay until it clicks into place. See Figure 67 on page 109.

Servicing the Processors

The server system requires at least one Intel® Xeon® Processor 7300 Series or at least one Dual-Core Intel® Xeon® Processor 7200 Series. Follow these rules:

- Each processor socket must include either a processor thermal blank, or a processor and heat sink combination.
- Processors must be installed in order, beginning with the CPU_1 socket, followed by the CPU_2 socket, and so on.

If you need to replace a processor:

1. Read the information about "Handling the Intel® Xeon® Processor MP", below.
2. Follow the instructions for "Removing a Processor" on page 115.
3. Follow the instructions for "Installing a Processor" on page 113.

If you are adding an additional processor:

1. Read the information on "Handling the Intel® Xeon® Processor MP", below.
2. Follow the instructions for "Removing a Processor Thermal Blank" on page 111.
3. Follow the instructions on "Installing a Processor" on page 113.

If you are removing a processor, but not installing a replacement processor:

1. Read the information on "Handling the Intel® Xeon® Processor MP", below.
2. Follow the instructions for "Removing a Processor" on page 115.
3. Follow the instructions on "Installing a Processor Thermal Blank" on page 112.

Handling the Intel® Xeon® Processor MP

The 64-bit Intel® Xeon® Processor 7300 Series and the 64-bit Dual-Core Intel® Xeon® Processor 7200 Series require special handling procedures:

- Observe the safety precautions, warnings, and cautions described in "Safety Information" on page iii.
- Ground yourself with a grounding heel or wrist strap, and an antistatic smock.
- Remove processors from the packaging at a clean ESD-protected work surface.
- When removing processors from the packaging, keep the package flat on the surface while you open it so that no processors fall from the packaging.
- Hold processors by their sides with the pins facing down.
- To avoid mechanical and / or ESD damage, do not touch the cartridge pin array or PCB components.

- When placing processors on the clean ESD-protected work surface, place them with their pins facing down. Do not stack processors on top of each other.

Installing and Removing a Processor Thermal Blank

Removing a Processor Thermal Blank

Caution: *Make sure to install a processor and a heat sink to replace the thermal blank. Only power on a system that has all four processor sockets populated with processor heat sinks and / or processor thermal blanks.*

Caution: *Using a processor thermal blank that is not expressly designed for the Intel® Server System S7000FC4UR is not supported and may result in processor thermal issues.*

The server may have from one to four processors installed on the main board. If you are adding a processor to the system, the thermal blank must be removed.

1. Remove the top cover. For instructions, see "Removing the Top Cover" on page 90.
2. Remove the processor air baffle. For instructions, see "Removing the Processor Air Baffle" on page 92.
3. Use a long Phillips* head screwdriver to loosen the four screws on the thermal blank.
4. Lift the thermal blank to remove it.

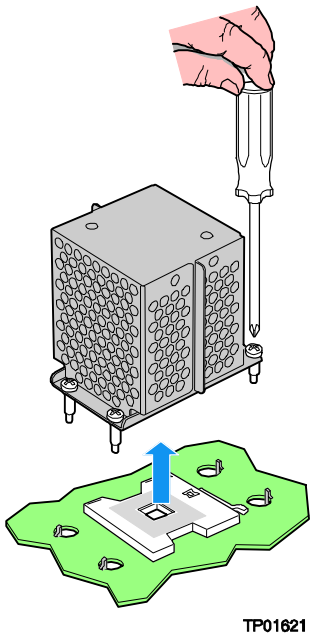


Figure 68. Removing a Thermal Blank

5. Install a processor in the empty socket. For instructions, see “Installing a Processor” on page 113.
6. Install the processor air baffle. For instructions, see “Installing the Processor Air Baffle” on page 94.
7. Install the top cover. For instructions, see “Installing the Top Cover” on page 91.

Installing a Processor Thermal Blank

If a processor and its heat sink are removed from the system, a thermal blank must be installed to maintain proper airflow within the chassis.

1. Remove the top cover. For instructions, see “Removing the Top Cover” on page 90.
2. Remove the processor air baffle. For instructions, see “Removing the Processor Air Baffle” on page 92.
3. Position the thermal blank on the main board. See the following figure.
4. Use a long Phillips head screwdriver to lightly engage the four screws.
5. Tighten the four screws to secure the processor thermal blank.

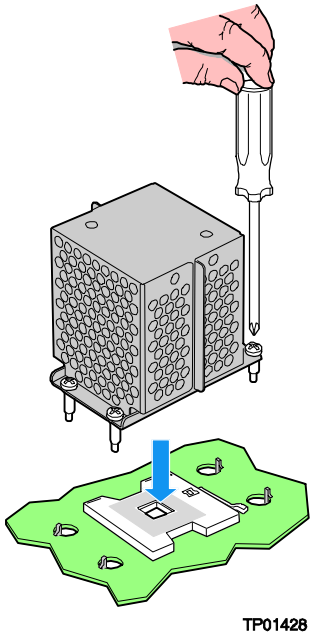


Figure 69. Installing a Thermal Blank

6. Install the processor air baffle. For instructions, see “Installing the Processor Air Baffle” on page 94.
7. Install the top cover. For instructions, see “Installing the Top Cover” on page 91.

Installing and Removing a Processor

Installing a Processor

Caution: *Failure to correctly apply thermal grease between a processor and the heat sink could cause damage to the server.*

Caution: *Using a processor heat sink that is not expressly designed for the Intel® Server System S7000FC4UR is not supported and may result in processor thermal issues.*

1. Remove the top cover. For instructions, see "Removing the Top Cover" on page 90.
2. Remove the processor air baffle. For instructions, see "Removing the Processor Air Baffle" on page 92.
3. If a processor thermal blank is installed, remove it. For instructions, see "Removing a Processor Thermal Blank" on page 111.
4. Open the processor release lever. See the following figure.

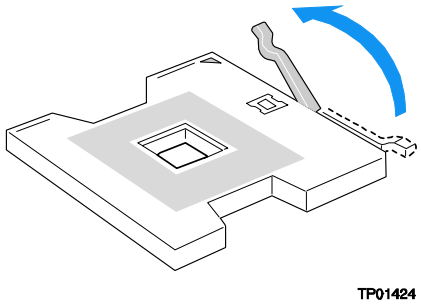


Figure 70. Open Processor Socket Release Lever

5. Position the processor over the socket, matching the two triangles and lining up the processor pins with the socket. See letter "A" in the following figure. Do not apply force. If the processor does not fit easily in the socket, check and correct the positioning.
6. Once the processor is in the socket, gently press the processor to verify the processor has seated properly.

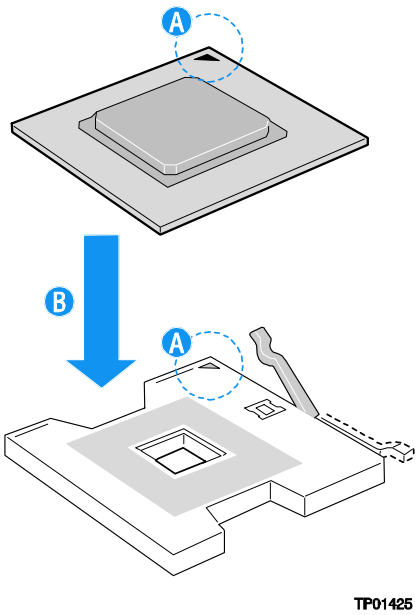


Figure 71. Set Processor into Socket

7. Close the processor release lever as shown in the following figure.

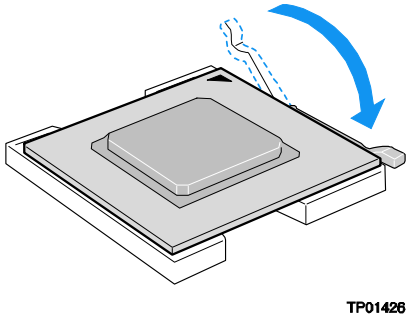


Figure 72. Close Processor Socket Lever

8. If the heat sink does not have thermal grease on the bottom of it, apply thermal grease to cover the area where the heat sink will touch the processor.
9. Set the heat sink on the processor, aligning the four screws in the heat sink with the screw holes in the main board.
10. Use a long Phillips screwdriver to turn each screw one full turn. Continue to tighten the screws approximately one full turn at a time until each is evenly tightened. Do not fully tighten one screw at a time.
11. Install the processor air baffle. For instructions, see “Installing the Processor Air Baffle” on page 94.

12. Install the top cover. For instructions, see “Installing the Top Cover” on page 91.

Removing a Processor

Note: *To aid in separating the heat sink from the processor, power on the server for a few minutes. This will warm the thermal grease and prevent the processor from pulling out of the closed socket. Make sure the heat sink is cool to the touch before removing.*

1. Remove the top cover. For instructions, see “Removing the Top Cover” on page 90.
2. Remove the processor air baffle. For instructions, see “Removing the Processor Air Baffle” on page 92.
3. Use a long Phillips* head screwdriver to loosen the four screws on the corners of the heat sink.
4. Gently rock the heat sink back and forth to break the seal between the heat sink and the processor.
5. Lift the heat sink from the processor.
6. Lift the release lever on the processor socket. See the following figure.

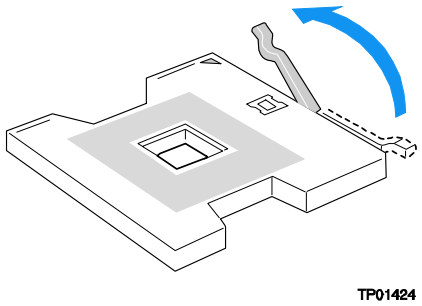


Figure 73. Open Processor Socket Release Lever

7. Remove the processor from the chassis. Store it in an anti-static bag or in the original packaging.
8. Install a replacement processor or install a processor thermal blank in the processor socket. For instructions, see “Installing a Processor” on page 113 or “Installing a Processor Thermal Blank” on page 112.
9. Install the processor air baffle. For instructions, see “Installing the Processor Air Baffle” on page 94.
10. Install the top cover. For instructions, see “Installing the Top Cover” on page 91.

Note: *Once the processor is removed, note that the release mechanism shows the socket is open.*

Removing and Installing the Center Brace

Removing the Center Brace

1. Remove the top cover. For instructions, see “Removing the Top Cover” on page 90.
2. Remove all memory boards. For instructions, see “Removing a Memory Board” on page 76.
3. Remove the SAS riser board. For instructions, see “Removing the SAS Riser Board” on page 99
4. Remove all full-length PCI Express* cards. For instructions, see “Removing a Non-hot-swap PCI Card” on page 74.
5. Slide the latches at each side of the chassis to the unlock position. See letter “A” in the following figure.
6. Lift the center brace from the system. See letter “B” in the figure.

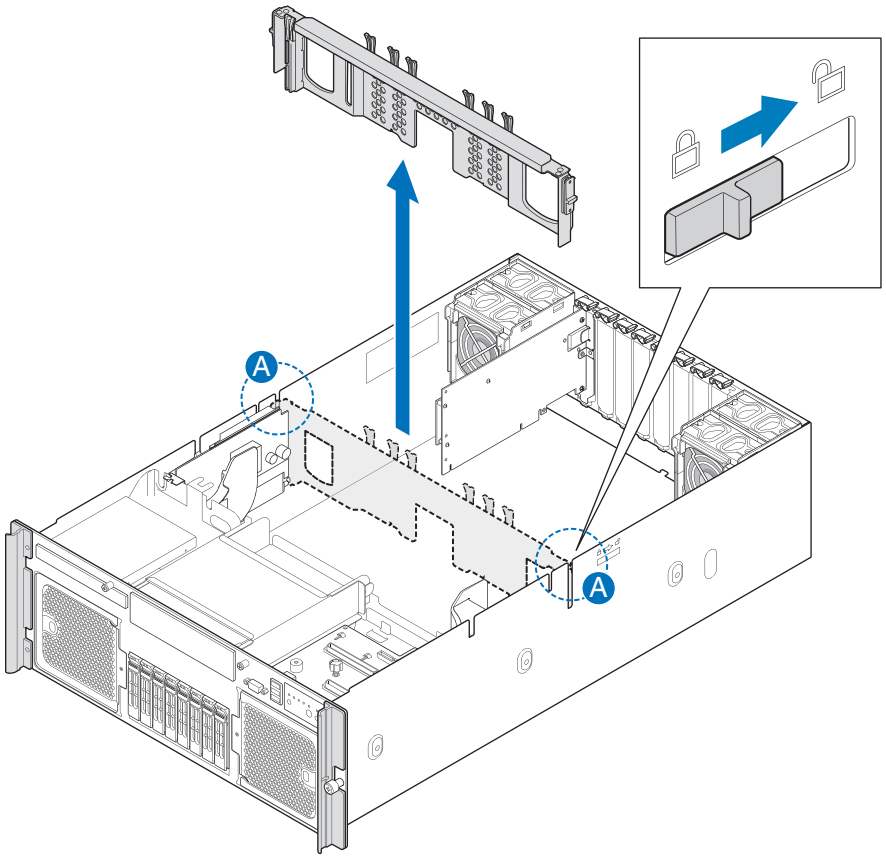


Figure 74. Removing the Center Brace

Installing the Center Brace

Set the center brace into position in the chassis. When correctly positioned, the latches will snap closed.

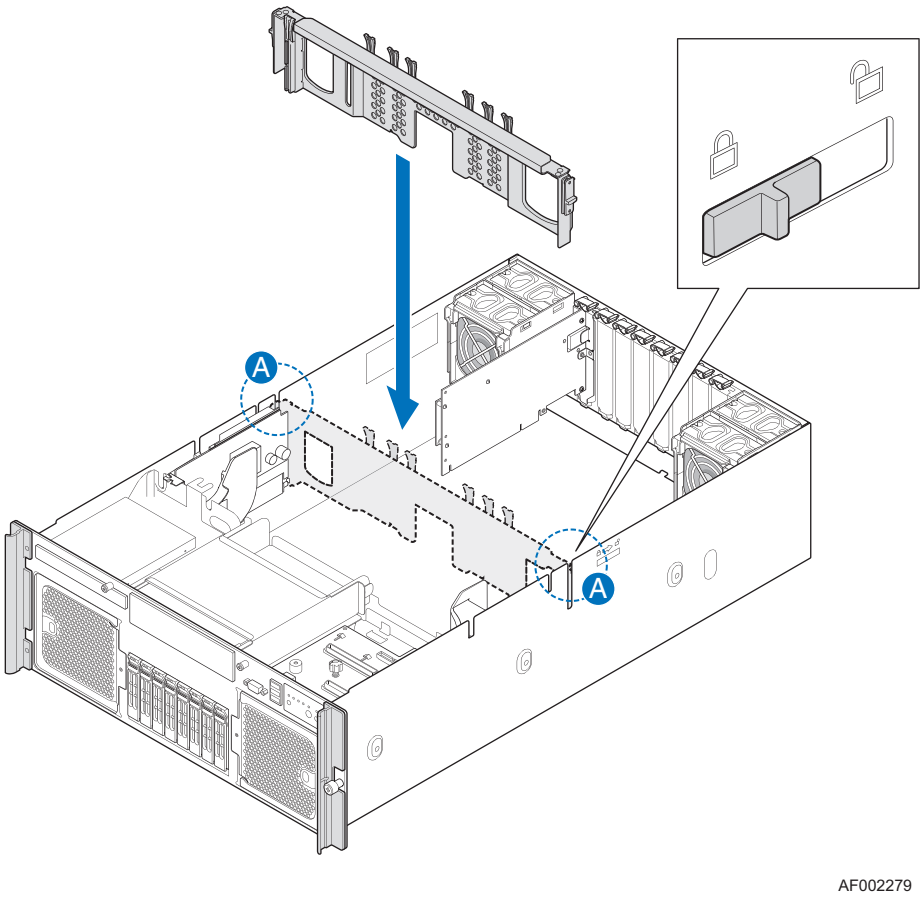


Figure 75. Installing the Center Brace

Installing and Removing the I/O Riser Board

Installing the I/O Riser Board

1. Remove the top cover. For instructions, see “Removing the Top Cover” on page 90.
2. Being careful not to touch the components or connectors on the I/O riser card, remove the card from the anti-static bag and place it on a clean, ESD-protected work surface.
3. Optional: Install the Intel® Remote Management Module 2 (Intel® RMM2) and RMM2 NIC onto the I/O riser board. For instructions, see “Installing the Intel® RMM2 and NIC Module” on page 119.
4. Rotate the retention latch at the rear of the card slot into the up position.
5. If an expansion slot cover is installed, remove it by sliding it up.
6. Press the card down firmly until it seats into the slot.
7. Install the top cover. For instructions, see “Installing the Top Cover” on page 91.

Removing the I/O Riser Board

1. Remove the top cover. For instructions, see “Removing the Top Cover” on page 90.
2. Optional: Remove the Intel® Remote Management Module 2 (Intel® RMM2) and RMM2 NIC from the I/O riser board if they are installed. For instructions, see “Removing the Intel® RMM2 and NIC Module” on page 121.
3. Rotate the retention latch at the rear of the card slot into the up position. See letter “A” in the following figure.
4. Installed an expansion slot cover by sliding it down to cover the opening.
5. Press the card down firmly until it seats into the slot.
6. Install the top cover. For instructions, see “Installing the Top Cover” on page 91.

Installing and Removing the Intel® Remote Management Module 2 (Intel® RMM2)

The optional Intel® RMM2 comes as a kit with these contents:

- One Intel® Remote Management Module 2 with one plastic standoff pre-installed
- One network interface card (NIC) module
- One plastic bag of screws, a slot bracket, cabling, and three plastic standoffs (these standoffs are not used for this installation)

Installing the Intel® RMM2 and NIC Module

1. Remove the top cover. For instructions, see "Removing the Top Cover" on page 90.
2. Remove the I/O riser card. For instructions, see "Removing the I/O Riser Board" on page 118.
3. Set the I/O riser card on a static-controlled surface with the components facing up.
4. Write down the MAC address on the Intel® RMM2. It is on a label attached to the Intel® RMM2. If you do not write down the MAC address before installing the Intel® RMM2, you will need to open the system later to record this information before you can configure the Intel® RMM2.

Note: *The I/O gasket is required to meet EMI requirements.*

5. Peel the backing from the EMI gasket that is included with your Intel® Remote Management Module 2 kit. See letter "A" in the following figure.
6. Adhere the EMI gasket to the I/O riser board where the NIC will contact the I/O riser. See letter "B" in the figure.

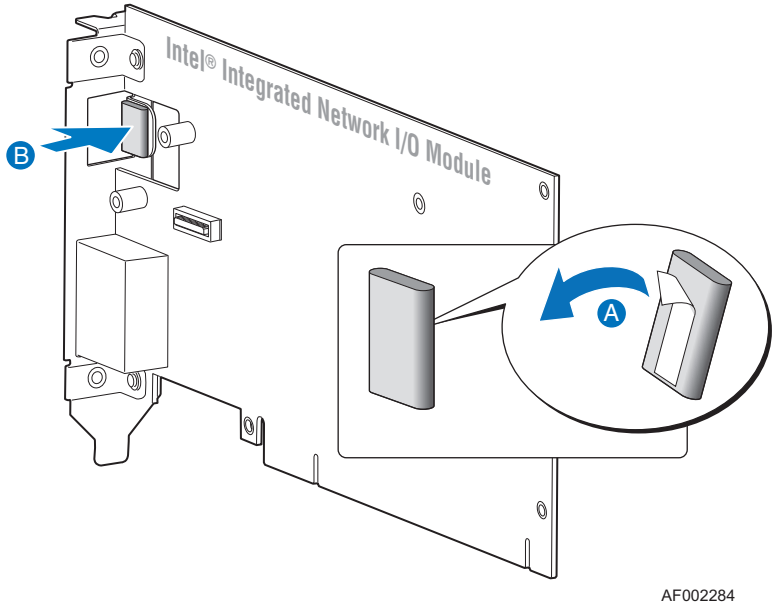


Figure 76. Attaching the EMI Gasket

7. Screw the NIC module to the J2B1 header on the I/O riser board, using the provided screws. This aligns the RJ-45 port with the opening on the back cover of the I/O riser board. See the following figure.

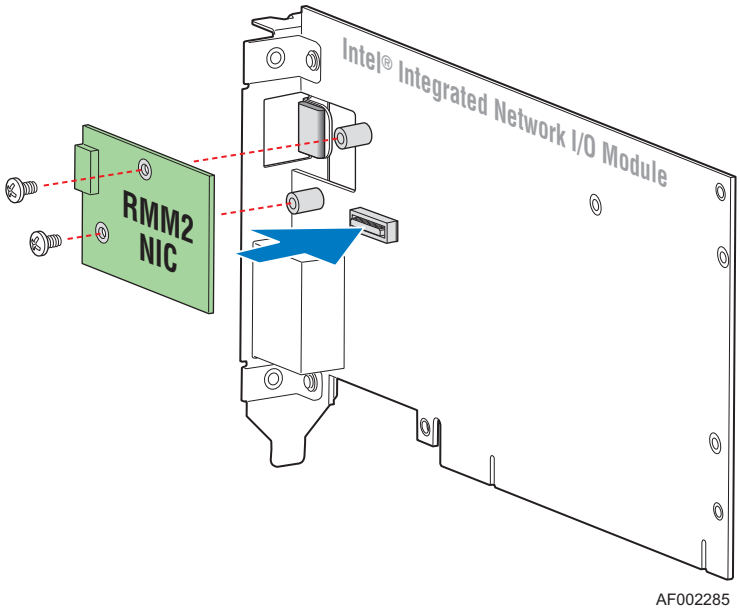


Figure 77. Installing the RMM2 NIC

8. Align the connector on the Intel® RMM2 to the J6C1 connector on the I/O riser board and align the plastic standoff on the Intel® RMM2 corresponding hole in the I/O riser board.
9. Push down on the Intel® RMM2 to attach it to the I/O riser board.

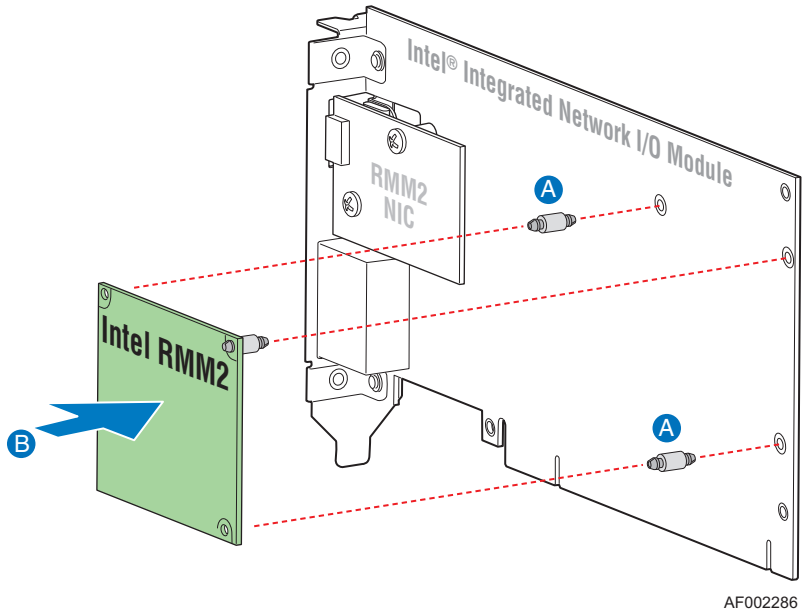


Figure 78. Installing the Intel® RMM2

10. Install the I/O riser board. For instructions, see "Installing the I/O Riser Board" on page 118.
11. Install the top cover. For instructions, see "Installing the Top Cover" on page 91.

Removing the Intel® RMM2 and NIC Module

1. Remove the top cover. For instructions, see "Removing the Top Cover" on page 90.
2. Remove the I/O riser card. For instructions, see "Removing the I/O Riser Board" on page 118.
3. Set the I/O riser card on a static-controlled surface with the components facing up.
4. Align the connector on the Intel® RMM2 to the J6C1 connector on the I/O riser board and align the plastic standoff on the Intel® RMM2 corresponding hole in the I/O riser board.
5. Pull up gently but firmly on the Intel® RMM2 to remove it from the I/O riser board.
6. Unscrew the NIC module from the J2B1 header on the I/O riser board
7. Install the I/O riser board. For instructions, see "Installing the I/O Riser Board" on page 118.
8. Install the top cover. For instructions, see "Installing the Top Cover" on page 91.

Replacing the Main Board

Removing the Main Board

1. Remove the top cover. For instructions, see “Removing the Top Cover” on page 90.
2. Remove the processor air baffle. For instructions, see “Removing the Processor Air Baffle” on page 92.
3. Remove the lower center air baffle. For instructions, see “Removing the Lower Air Baffle” on page 96.
4. Remove the SAS riser board. For instructions, see “Removing the SAS Riser Board” on page 99.
5. Remove the center brace. For instructions, see “Removing the Center Brace” on page 116.
6. Remove all PCI Express add-in cards. For instructions, see “Removing a Non-hot-swap PCI Card” on page 74.
7. Remove the I/O riser board. For instructions, see “Removing the Front Panel Board” on page 131.
8. Remove all memory boards and memory board air baffles. For instructions, see “Removing a Memory Board” on page 76.
9. Remove all rear fans. For instructions, see “Hot-swapping a Rear System Fan” on page 60. Follow steps 2 and 3 only.
10. Remove the rear fan bays. To remove, pull out the blue latch on the fan bay and lift the fan bay from the system.
11. Remove all installed processors. For instructions, see “Handling the Intel® Xeon® Processor MP” on page 110 and then “Removing a Processor” on page 115. Follow steps 3 through 7 only.
12. Remove the plastic PCI slot dividers:
    a. A rivet is on each side of the divider assembly. Pull up on the two rivets. See letter “A” in the following figure.
    b. Lift the divider assembly from the server. See letter “B” in the figure.

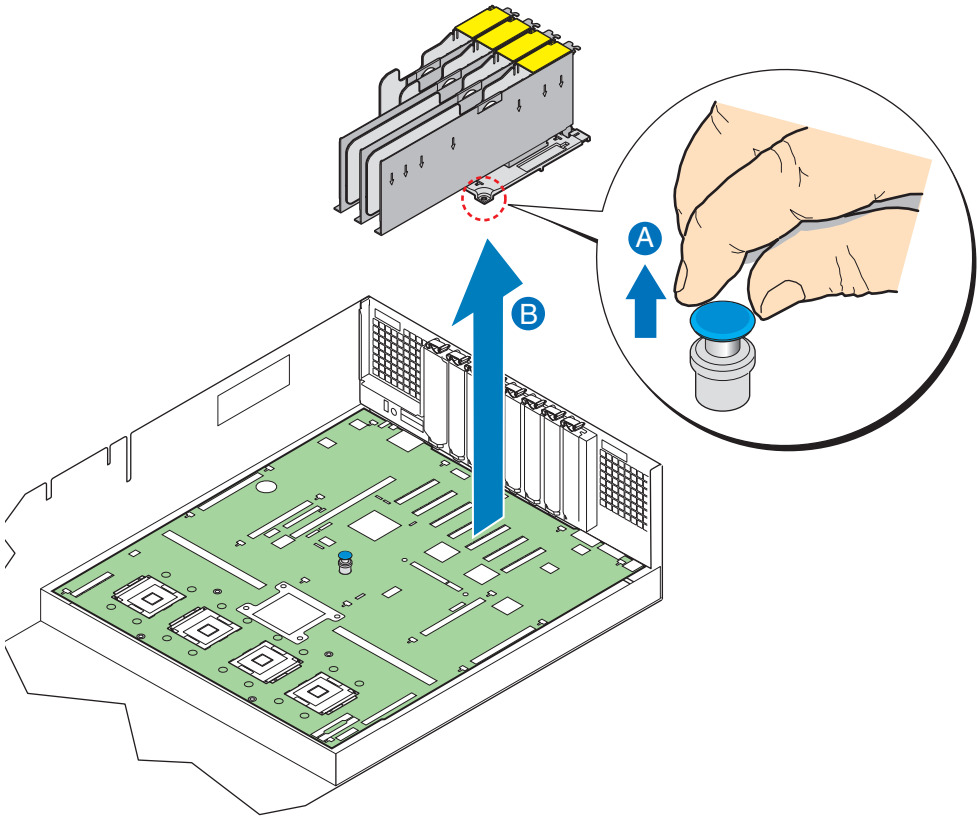


Figure 79. Removing the PCI Dividers

13. Disconnect the chassis intrusion cable from the main board. To locate the cable connection, see Figure 46 on page 87.
14. Disconnect any cables still connected to the main board.
15. Lift the blue plunger in the center of the main board. See letter “A” in the following figure.
16. While holding the plunger up, slide the main board toward the front of the chassis. See letter “B” in the figure.
17. Use the plunger to lift the board from the chassis. See letter “C” in the figure.
18. Install a replacement main board. For instructions, see “Installing the Main Board” on page 124.

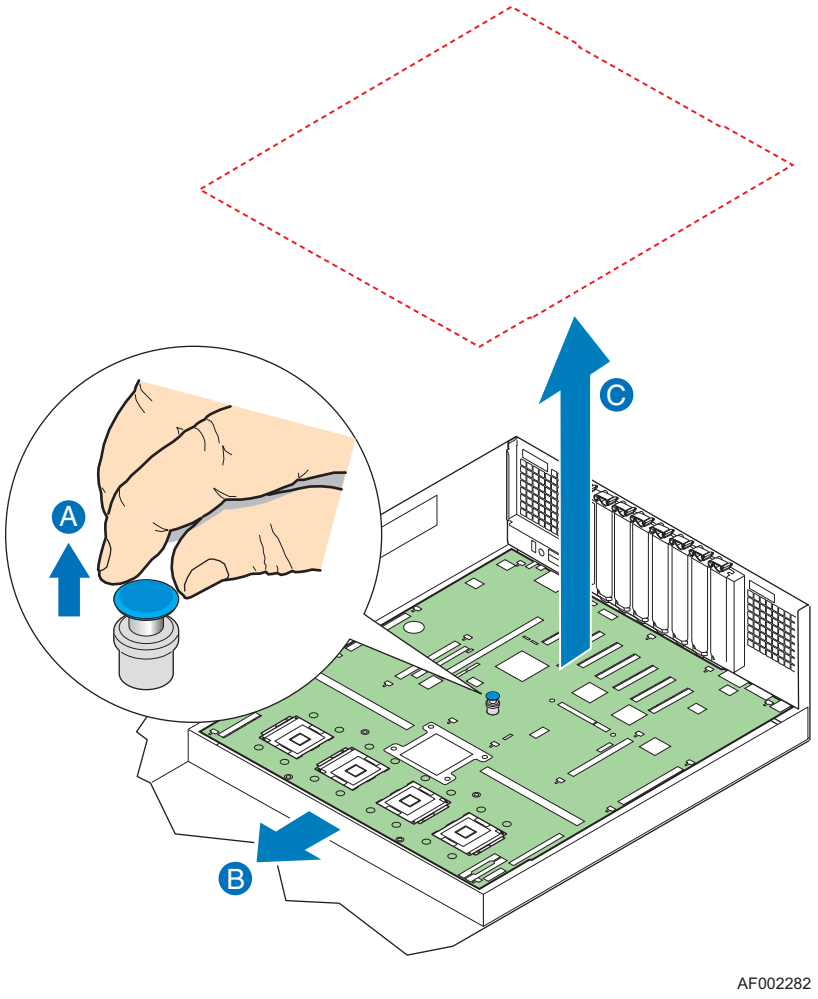


Figure 80. Removing the Main Board

Installing the Main Board

1. Set the main board into the chassis. See letter “A” in the following figure.
2. Hold up the plunger at the center of the board. See letter “B” in the figure.
3. While holding the plunger, slide the board to the rear of the chassis, aligning the two slots at the rear of the board with the tabs in the chassis. See letter “C” in the figure.
4. Release the plunger and ensure it is fully seated.

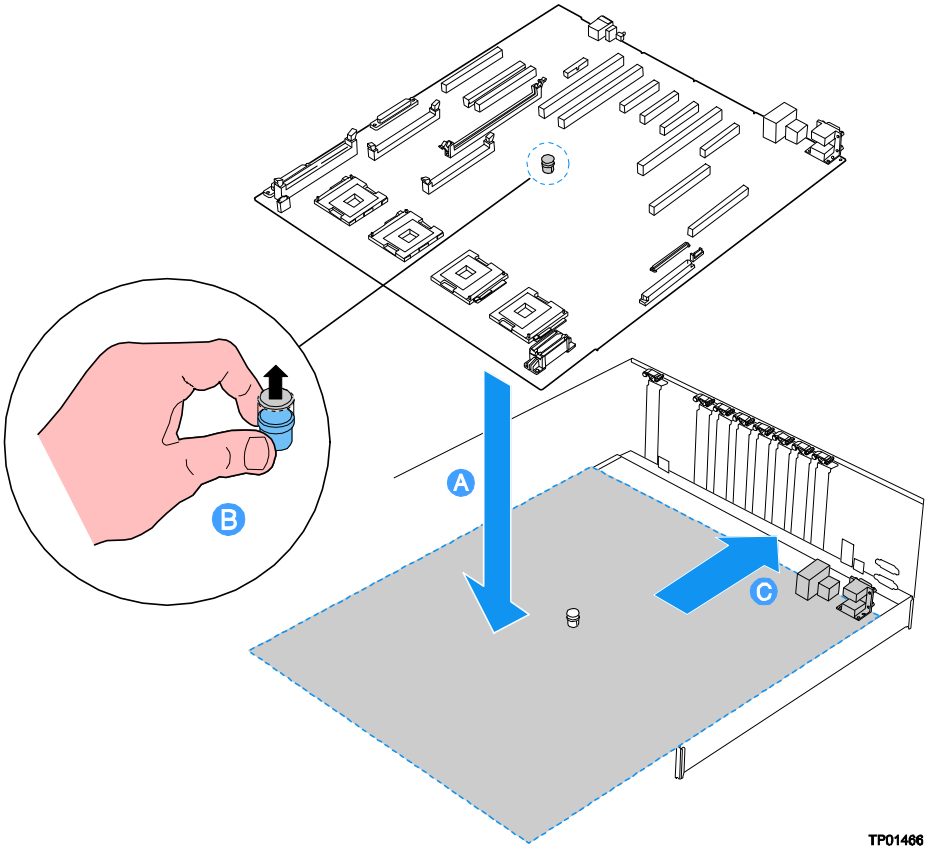


Figure 81. Installing the Main Board

5. Install the PCI slot dividers by lining up the rivets in the divider base with the holes in the main board. Push down on the rivets. See the following figure.

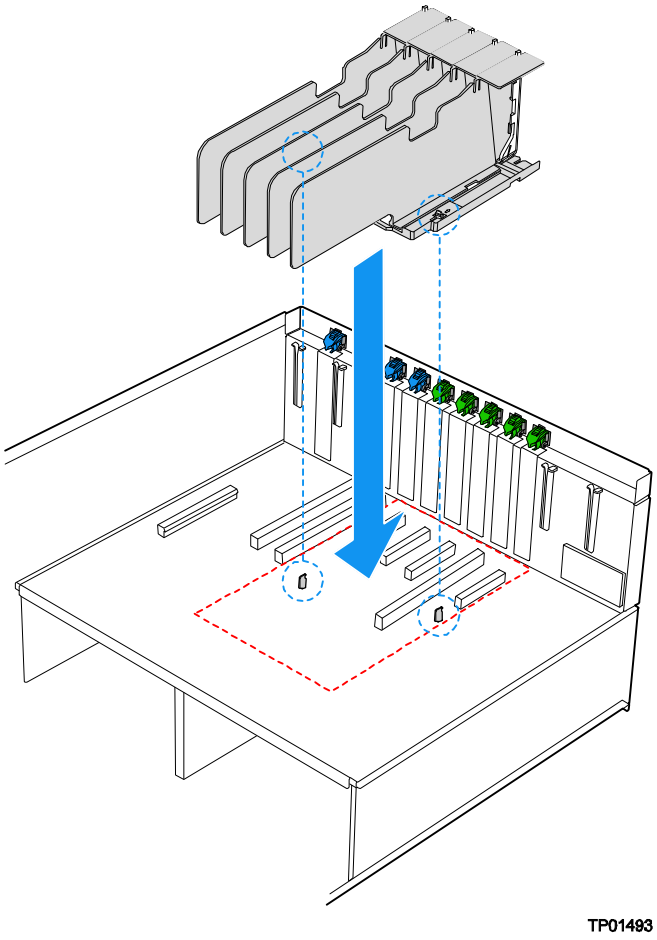


Figure 82. Installing the PCI Slot Dividers

6. Connect the three-cable bundle from the power distribution board to the connectors on the main board.
7. Connect the chassis intrusion switch cable to the main board.
8. Install the lower air baffle. For instructions, see "Removing the Lower Air Baffle" on page 96.
9. Install the center brace. For instructions, see "Installing the Center Brace" on page 117.
10. Install the SAS riser board. For instructions, see "Installing the SAS Riser Board" on page 98.
11. Install the I/O riser board. For instructions, see "Installing the I/O Riser Board" on page 118.
12. Install the processors. See "Handling the Intel® Xeon® Processor MP" on page 110 and then "Installing a Processor" on page 113.

13. Install your PCI Express* add-in cards. For instructions, see "Installing a Non-hot-swap PCI Card" on page 75.
14. Install the memory boards and memory board air baffles. For instructions, see "Installing a Memory Board" on page 78.
15. Install the processor air baffle. For instructions, see "Installing the Processor Air Baffle" on page 94.
16. Connect any remaining cables to the main board. For the connection locations, see Figure 46 on page 87.
17. Install the top cover. For instructions, see "Installing the Top Cover" on page 91.

Replacing the SAS Backplane Board

The SAS backplane board is located behind the peripheral devices on the underside of the peripheral bay.

Removing the SAS Backplane Board

Caution: *Before removing any hard drives, note their locations. Hard drives must be reinstalled in their original positions. Failure to reinstall the drives in the correct locations may result in a loss of data.*

1. Remove all hot-swap hard drive carriers. For instructions, see "Removing a Hard Drive Carrier" on page 63.
2. Remove the top cover. For instructions, see "Removing the Top Cover" on page 90.
3. Remove the main board. For instructions, see "Removing the Main Board" on page 122.
4. Disconnect all cables attached to the SAS backplane.
5. Press the blue labeled latch that secures the SAS backplane board to the chassis and use the black plastic tab to lightly push the SAS backplane board toward the right side of the system.
6. Pull the backplane rearward to disengage the hooks.
7. Pull the SAS backplane upward to remove it.
8. Store the SAS backplane in an anti-static bag.
9. Install the replacement SAS backplane. For instructions, see "Installing the SAS Backplane Board" on page 128.

Installing the SAS Backplane Board

1. Place the SAS backplane board over the eight hooks and then push the backplane forward.
2. Use the black plastic tab to slide the board to the left, engaging all of the hooks, until the blue labeled latch locks into place.
3. Connect the cables you disconnected when you removed the SAS backplane board. See Figure 47.
4. Install the main board. For instructions, see "Installing the Main Board" on page 124.
5. Install the top cover. For instructions, see "Installing the Top Cover" on page 91.
6. Install the hot-swap hard drives and hard drive carriers. For instructions, see "Installing a Hard Drive Carrier" on page 65.

Replacing the Power Distribution Board

The power distribution board provides the output power interface between the hot-swap power supplies and the main board.

Removing the Power Distribution Board

1. Remove the power supplies. For instructions, see "Hot-swapping a Power Supply" on page 66. Follow steps 2 through 4 only.
2. Remove the top cover. For instructions, see "Removing the Top Cover" on page 90.
3. Remove the main board. For instructions, see "Removing the Main Board" on page 122.
4. Disconnect the power distribution cable from the SAS backplane. See letter "A" in the following figure.

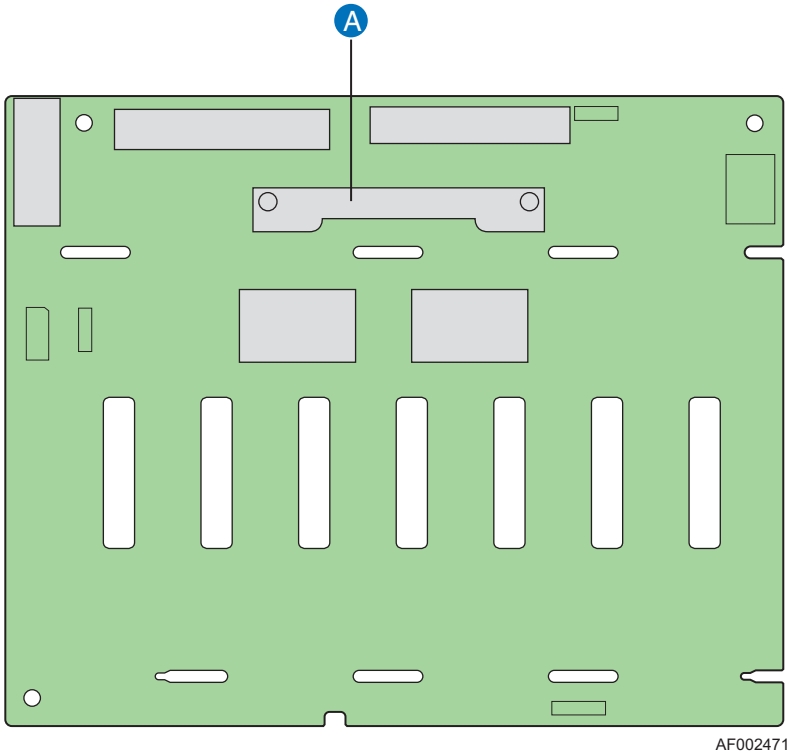


Figure 83. Power Distribution Cable Location on SAS Backplane

5. Remove the seven screws on the power distribution board. See letter “A” in the following figure.
6. Lift the board from the chassis. See letter “B” in the figure.

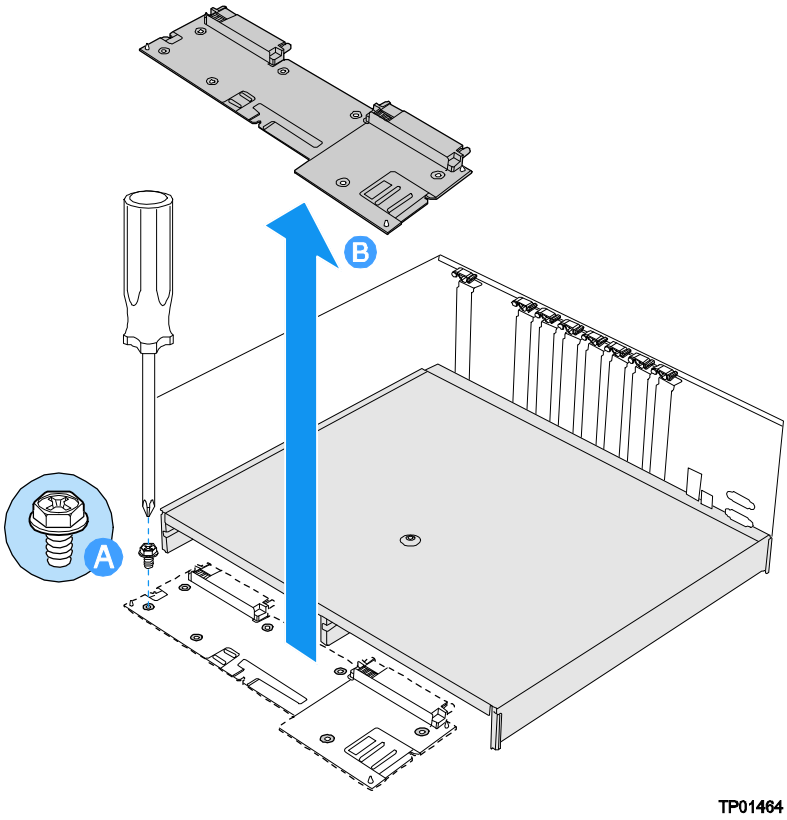


Figure 84. Removing the Power Distribution Board

7. Install the replacement power distribution board. For instructions, see “Installing the Power Distribution Board” on page 130.

Installing the Power Distribution Board

1. Set the power distribution board in place.
2. Use the seven screws to secure the power distribution board to the chassis.
3. Connect the cable between the power distribution board and the SAS backplane.
4. Connect the power distribution cable on the SAS backplane. See Figure 83 on page 129 to locate the connector on the SAS backplane.
5. Install the power supplies. For instructions, see “Hot-swapping a Power Supply” on page 66. Follow steps 7 through 9 only.
6. Install the main board. For instructions, see “Installing the Main Board” on page 124.
7. Install the top cover. For instructions, see “Installing the Top Cover” on page 91.

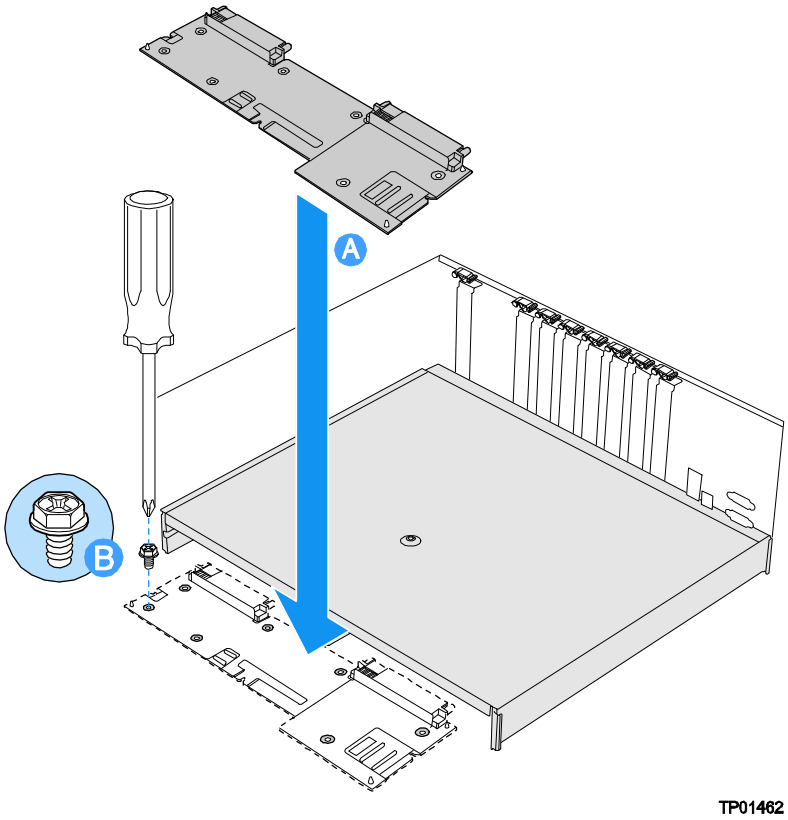


Figure 85. Installing the Power Distribution Board

Replacing the Front Panel Board

Removing the Front Panel Board

1. Remove the top cover. For instructions, see “Removing the Top Cover” on page 90.
2. Remove the processor air baffle. For instructions, see “Removing the Processor Air Baffle” on page 92.
3. Disconnect all cables attached to the front panel I/O board.
4. Pull up on the captive screw. See letter “A” in the following figure.
5. Slide the board towards the rear of the chassis until the tabs disengage from the board. See letters “B” and “C” in the figure.
6. Lift the board from the chassis. See letter “D”.

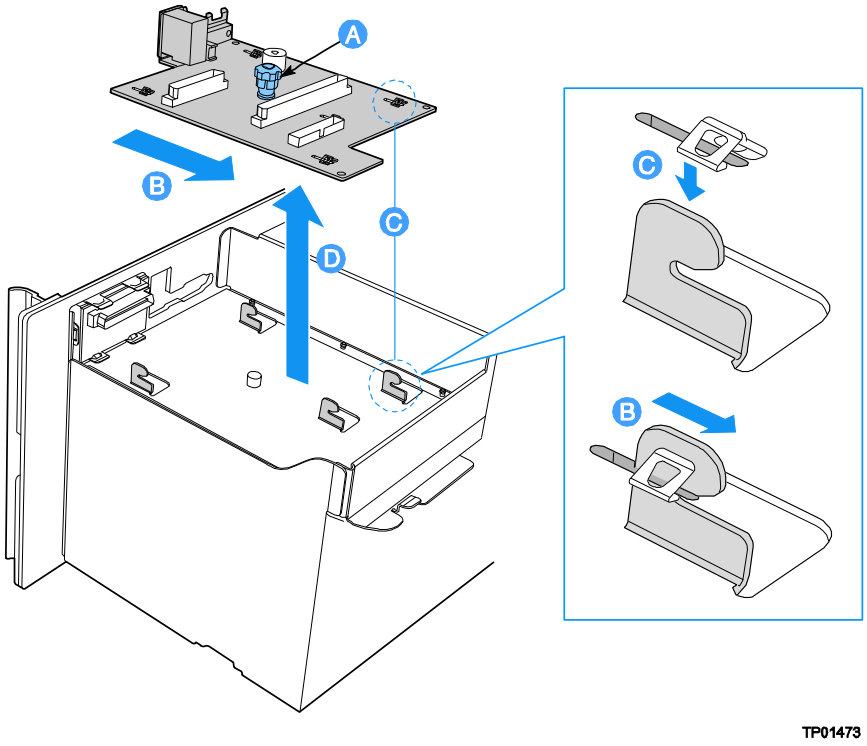


Figure 86. Removing the Front Panel I/O Board

7. Install the replacement front panel I/O board. For instructions, see “Installing the Front Panel Board” on page 132.

Installing the Front Panel Board

1. Set the front panel I/O board in place over the hooks. See letters “A” and “B” in the following figure.
2. Slide the front panel I/O board forward until seated over the hooks. See letter “C” in the figure.
3. Tighten the captive screw. See letter “D”.
4. Reconnect all cables you disconnected when you removed the front panel I/O board. For connection locations, see Figure 49 on page 89.
5. Install the processor air baffle. For instructions, see “Installing the Processor Air Baffle” on page 94.
6. Install the top cover. For instructions, see “Installing the Top Cover” on page 91.

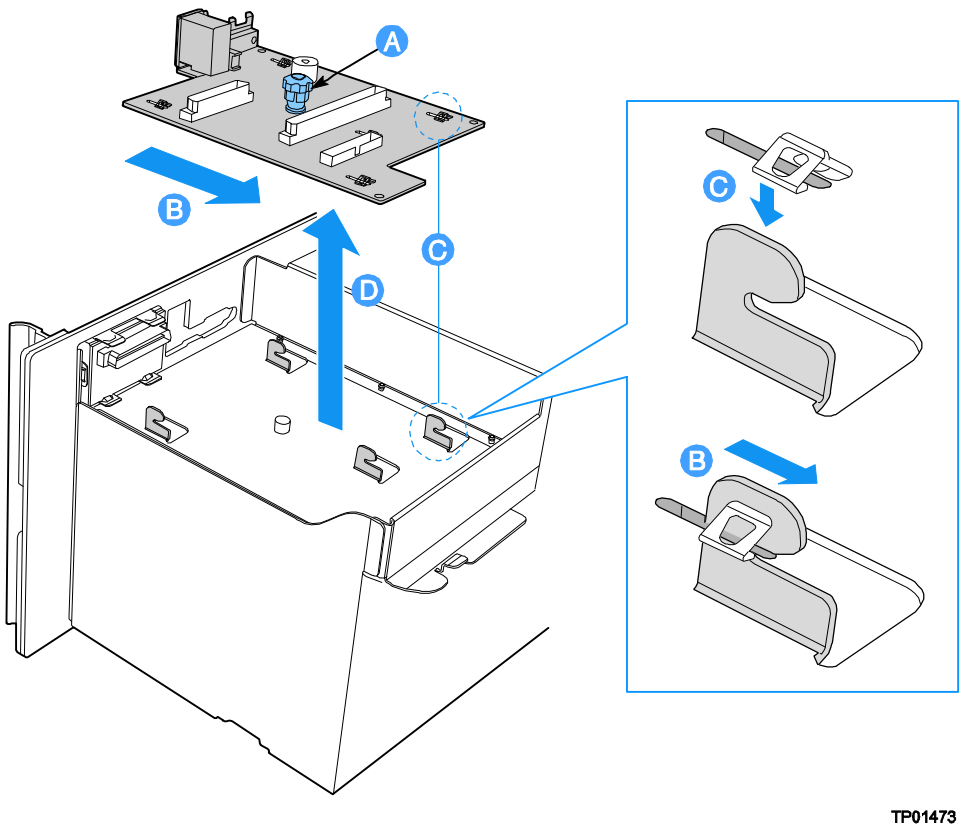


Figure 87. Installing the Front Panel I/O Board

Replacing the CMOS Battery

The lithium battery on the main board powers the real-time clock (RTC) for three to four years in the absence of power. When the battery weakens, it loses voltage and the system settings stored in CMOS RAM and the Real Time Clock (such as the date and time) can be wrong. Contact your customer service representative or dealer for a list of approved replacement batteries.

The following warning and translations are required by specific certifying agencies to be printed immediately adjacent to the procedure for removing the battery.

Warning: *Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.*

Advarsel: Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

Advarsel: Lithiumbatteri - Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.

Varning: Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

Varoitus: Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

1. Remove the top cover. For instructions, see "Removing the Top Cover" on page 90.
2. If memory boards C and D are installed, remove them to expose the battery. For instructions, see "Removing a Memory Board" on page 76.
3. Place your finger on the edge of the battery, between the two smaller prongs that hold the battery in place.
4. Without pulling up on the battery, push the battery toward the larger prongs until the edge of the battery clears the small prongs.
5. Maintain pressure on the battery while pulling up on the released edge of the battery to lift it from the server. See the following figure.

Caution: *Do not attempt to pull the battery up until it is pushed clear of the smaller prongs. Doing so may damage the battery holder.*

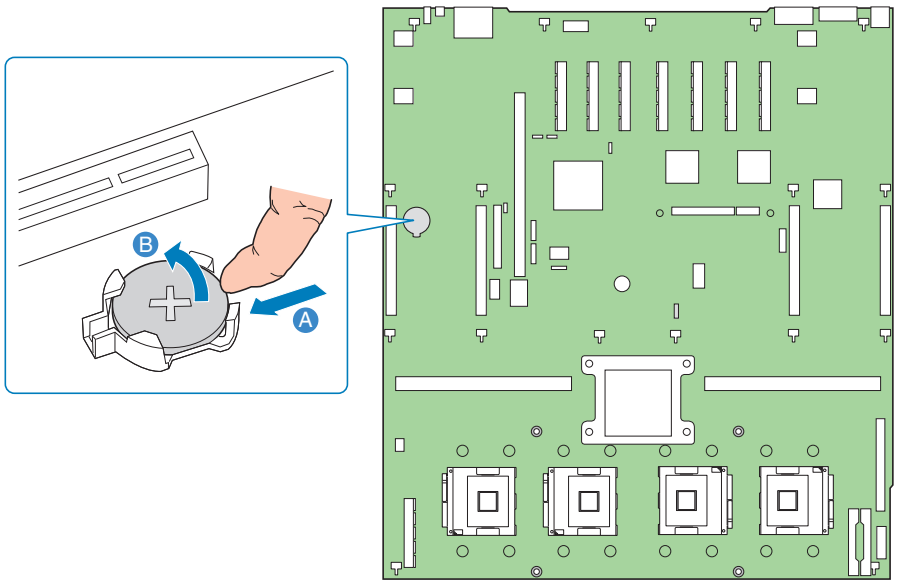


Figure 88. Removing the Battery

6. Dispose of the battery according to local ordinance.
7. Remove the new lithium battery from its package.
8. Being careful to observe the correct polarity, insert the battery at an angle into the battery socket with the edge of the battery under the larger prongs in the battery socket.
9. Push the battery toward the larger prongs while pushing down on the raised edge of the battery until it clicks into place under all four prongs.
10. If you needed to remove memory boards to access the battery, install them. For instructions, see “Installing a Memory Board” on page 78.
11. Install the top cover. For instructions, see “Installing the Top Cover” on page 91.

Appendix A: POST Codes

The system BIOS displays error messages on the video screen. Before video initialization, beep codes inform you of errors. POST error codes are logged in the event log. The BIOS displays POST error codes on the video monitor.

Eight light-emitting diodes indicate the raw binary output of port 80 values. These LEDs are arranged so you can see a direct correlation to the binary equivalent. The table shows the correlation of port 80 post code bit to LED reference designator.

Table 8. Port 80 POST Code LEDs

Port 80 POST Code Bit	LED Reference Designator
7 (MSB)	DS4E8
6	DS4E7
5	DS4E6
4	DS4E5
3	DS4E4
2	DS4E3
1	DS4E2
0 (LSB)	DS4E1

POST Progress Codes and Messages

The system BIOS complies with the EFI Framework POST Progress Code specification by reporting 32-bit status codes at various points during POST that contain class, subclass, and operation information. The class and subclass fields describe the type of hardware that is being initialized. The operation field represents the specific initialization activity.

The system BIOS truncates 32-bit EFI POST Progress Codes to 8-bit values for display on the system board Diagnostic LED array. The resulting 8-bit POST code is displayed on the system board POST Code Diagnostic LED array at the start of each configuration process. This information can be used to assist with debugging system hangs during POST by identifying the last POST process initiated by the BIOS.

Table 9. POST Progress Codes and Messages

Progress Code	Progress Code Meaning
Host Processor	
0x10	Power-on initialization of the host processor (Boot Strap Processor)
0x11	Host processor cache initialization (including AP)
0x12	Starting Application processor initialization
0x13	SMM initialization
Chipset	
0x21	Initializing a chipset component
Memory	
0xE1	No memory available (system halted)
0xE4	BIOS cannot communicate with FBDIMM (serial channel hardware failure)
0xE6	FBDIMM(s) failed Memory iBIST or Memory Link Training failure
0xEB	FBDIMM with corrupted SPD data detected (system halted)
0x22	Reading configuration data from memory (SPD on DIMM)
0x23	Detecting presence of memory
0x24	Programming timing parameters in the memory controller
0x25	Configuring memory parameters in the memory controller
0x26	Optimizing memory controller settings
0x27	Initializing memory, such as ECC init
0x28	Testing memory
PCI Bus	
0x50	Enumerating PCI buses
0x51	Allocating resources to PCI buses
0x52	Hot Plug PCI controller initialization
0x53-0x57	Reserved for PCI Bus
USB	

Table 9. POST Progress Codes and Messages

Progress Code	Progress Code Meaning
0x58	Resetting USB bus
0x59	Reserved for USB devices
ATA / ATAPI / SATA	
0x5A	Resetting PATA / SATA bus and all devices
0x5B	Reserved for ATA
SMBUS	
0x5C	Resetting SMBUS
0x5D	Reserved for SMBUS
Local Console	
0x70	Resetting the video controller (VGA)
0x71	Disabling the video controller (VGA)
0x72	Enabling the video controller (VGA)
Remote Console	
0x78	Resetting the console controller
0x79	Disabling the console controller
0x7A	Enabling the console controller
Keyboard (USB only)	
0x90	Resetting the keyboard
0x91	Disabling the keyboard
0x92	Detecting the presence of the keyboard
0x93	Enabling the keyboard
0x94	Clearing keyboard input buffer
0x95	Instructing keyboard controller to run self-test (PS2 only)
Mouse (USB only)	
0x98	Resetting the mouse
0x99	Detecting the mouse
0x9A	Detecting the presence of mouse
0x9B	Enabling the mouse
Fixed Media	
0xB0	Resetting fixed media device

Table 9. POST Progress Codes and Messages

Progress Code	Progress Code Meaning
0xB1	Disabling fixed media device
0xB2	Detecting presence of a fixed media device (IDE hard drive detection, etc.)
0xB3	Enabling / configuring a fixed media device
Removable Media	
0xB8	Resetting removable media device
0xB9	Disabling removable media device
0xBA	Detecting presence of a removable media device (IDE CDROM detection, etc.)
0xBC	Enabling / configuring a removable media device
Boot Device Selection	
0xDy	Trying boot selection y (where y = 0 to F)
Pre-EFI Initialization (PEI) Core	
0xE0	Started dispatching early initialization modules (PEIM)
0xE2	Initial memory found, configured, and installed correctly
0xE1,0xE3	Reserved for initialization module use (PEIM)
Driver Execution Environment (DXE) Core	
0xE4	Entered EFI driver execution phase (DXE)
0xE5	Started dispatching drivers
0xE6	Started connecting drivers
DXE Drivers	
0xE7	Waiting for user input
0xE8	Checking password
0xE9	Entering BIOS setup
0xEA	Flash Update
0xEE	Calling Int 19. One beep unless silent boot is enabled.
0xEF	Unrecoverable boot failure
Runtime Phase / EFI Operating System Boot	
0xF4	Entering sleep state
0xF5	Exiting sleep state

Table 9. POST Progress Codes and Messages

Progress Code	Progress Code Meaning
0xF8	Operating system has requested EFI to close boot services (ExitBootServices ( ) has been called)
0xF9	Operating system has switched to virtual address mode (SetVirtualAddressMap ( ) has been called)
0xFA	Operating system has requested a system reset (ResetSystem () has been called)
Pre-EFI Initialization Module (PEIM) / Recovery	
0x30	Crisis recovery has been initiated because of a user request
0x31	Crisis recovery has been initiated by software (corrupt flash)
0x34	Loading crisis recovery capsule
0x35	Handing off control to the crisis recovery capsule
0x3F	Unable to complete crisis recovery.

POST Error Messages and Handling

The POST Error Manager displays error messages reported by the system BIOS during POST. The system BIOS truncates the 32-bit EFI POST Progress Code associated with the error to 16-bit values for display in the POST Error Manager.

The POST Error Manager behavior in response to the error is defined by the error severity reported by the BIOS. Errors are categorized in one of three severity levels. The system behavior in response to severity level of:

- Fatal
  - The BIOS logs an error to the POST Error Manager.
  - The BIOS logs an error message to the BMC System Event Log (SEL).
  - The BIOS unconditionally enters POST Error Manager to display error message.
  - The BIOS halts the system to prevent boot.
  - The user needs to replace the faulty part and restart the system.
- Major
  - The BIOS logs an error to the POST Error Manager.
  - The BIOS logs an error message to the BMC System Event Log (SEL).
  - The BIOS continues booting in a degraded state by default (i.e. BIOS does not automatically enter the POST Error Manager to display the error message).

- The user can override this default behavior by configuring the BIOS Setup POST Error Pause option to Enabled. This forces the system to enter the POST Error Manager and display the error message before booting.
- The user can choose to take immediate corrective action or continue booting.

- Minor
  - The BIOS logs an error to the POST Error Manager.
  - The BIOS continues booting with a degraded state (i.e. BIOS does not automatically enter the POST Error Manager to display the error message).
  - The user may want to replace the erroneous unit.

The POST Error Manager reports a maximum of 500 errors on any single boot cycle. Errors are automatically cleared from the Error Manager on each boot.

Table 10. POST Error Manager Messages and Handling

POST Error Code	POST Error Manager Message	Severity
0012	CMOS date / time not set	Major
004C	Keyboard / interface error	Major
0108	Keyboard component encountered a locked error.	Minor
0109	Keyboard component encountered a stuck key error.	Minor
0113	Fixed Media The SAS RAID firmware can not run properly. The user should attempt to reflash the firmware.	Major
0140	PCI component encountered a PERR error.	Major
0141	PCI resource conflict	Major
0146	PXI out of resources error	Major
0192	Cache size mismatch	Fatal
0194	CPUID, processor family are different	Fatal
0195	Front side bus mismatch	Fatal
0196	Processor Model mismatch	Major
0197	Processor speeds mismatched	Fatal
0198	Processor family is unsupported	Major
019A	Processor voltage mismatch detected	Fatal
5220	CMOS / NVRAM configuration cleared	Major
5221	Passwords cleared by jumper	Major
5224	Password clear jumper is set	Major
8110	Processor 01 internal error (IERR) on last boot	Major

Table 10. POST Error Manager Messages and Handling

POST Error Code	POST Error Manager Message	Severity
8111	Processor 02 internal error (IERR) on last boot	Major
8112	Processor 03 internal error (IERR) on last boot	Major
8113	Processor 04 internal error (IERR) on last boot	Major
8120	Processor 01 thermal trip error on last boot	Major
8121	Processor 02 thermal trip error on last boot	Major
8122	Processor 03 thermal trip error on last boot	Major
8123	Processor 04 thermal trip error on last boot	Major
8130	Processor 01 disabled	Minor
8131	Processor 02 disabled	Minor
8132	Processor 03 disabled	Minor
8133	Processor 04 disabled	Minor
8160	Processor 01 unable to apply microcode update	Major
8161	Processor 02 unable to apply microcode update	Major
8162	Processor 03 unable to apply microcode update	Major
8163	Processor 04 unable to apply microcode update	Major
8180	Processor 01 microcode update not found	Minor
8181	Processor 02 microcode update not found	Minor
8182	Processor 03 microcode update not found	Minor
8183	Processor 04 microcode update not found	Minor
8190	Watchdog timer failed on last boot	Major
8198	Operating system boot watchdog timer expired on last boot	Major
8300	Baseboard management controller failed self-test	Major
8305	Hot-swap controller failed	Major
84F2	Baseboard management controller failed to respond	Major
84F3	Baseboard management controller in update mode	Major
84F4	Sensor data record empty	Major
84FF	System event log full	Minor
8500	Memory component could not be configured in the selected RAS mode	Major

Table 10. POST Error Manager Messages and Handling

POST Error Code	POST Error Manager Message	Severity
8520	Memory failed Self Test (BIST). Memory Board A, DIMM_1.	Major
8521	Memory failed Self Test (BIST). Memory Board A, DIMM_2.	Major
8522	Memory failed Self Test (BIST). Memory Board A, DIMM_3.	Major
8523	Memory failed Self Test (BIST). Memory Board A, DIMM_4.	Major
8524	Memory failed Self Test (BIST). Memory Board A, DIMM_5.	Major
8525	Memory failed Self Test (BIST). Memory Board A, DIMM_6.	Major
8526	Memory failed Self Test (BIST). Memory Board A, DIMM_7.	Major
8527	Memory failed Self Test (BIST). Memory Board A, DIMM_8.	Major
8528	Memory failed Self Test (BIST). Memory Board B, DIMM_1.	Major
8529	Memory failed Self Test (BIST). Memory Board B, DIMM_2.	Major
852A	Memory failed Self Test (BIST). Memory Board B, DIMM_3.	Major
852B	Memory failed Self Test (BIST). Memory Board B, DIMM_4.	Major
852C	Memory failed Self Test (BIST). Memory Board B, DIMM_5.	Major
852D	Memory failed Self Test (BIST). Memory Board B, DIMM_6.	Major
852E	Memory failed Self Test (BIST). Memory Board B, DIMM_7.	Major
852F	Memory failed Self Test (BIST). Memory Board B, DIMM_8.	Major
8530	Memory failed Self Test (BIST). Memory Board C, DIMM_1.	Major
8531	Memory failed Self Test (BIST). Memory Board C, DIMM_2.	Major
8532	Memory failed Self Test (BIST). Memory Board C, DIMM_3.	Major
8533	Memory failed Self Test (BIST). Memory Board C, DIMM_4.	Major

Table 10. POST Error Manager Messages and Handling

POST Error Code	POST Error Manager Message	Severity
8534	Memory failed Self Test (BIST). Memory Board C, DIMM_5.	Major
8535	Memory failed Self Test (BIST). Memory Board C, DIMM_6.	Major
8536	Memory failed Self Test (BIST). Memory Board C, DIMM_7.	Major
8537	Memory failed Self Test (BIST). Memory Board C, DIMM_8.	Major
8538	Memory failed Self Test (BIST). Memory Board D, DIMM_1.	Major
8539	Memory failed Self Test (BIST). Memory Board D, DIMM_2.	Major
853A	Memory failed Self Test (BIST). Memory Board D, DIMM_3.	Major
853B	Memory failed Self Test (BIST). Memory Board D, DIMM_4.	Major
853C	Memory failed Self Test (BIST). Memory Board D, DIMM_5.	Major
853D	Memory failed Self Test (BIST). Memory Board D, DIMM_6.	Major
853E	Memory failed Self Test (BIST). Memory Board D, DIMM_7.	Major
853F	Memory failed Self Test (BIST). Memory Board D, DIMM_8.	Major
8540	Memory Board A, DIMM_1 Disabled	Major
8541	Memory Board A, DIMM_2 Disabled	Major
8542	Memory Board A, DIMM_3 Disabled	Major
8543	Memory Board A, DIMM_4 Disabled	Major
8544	Memory Board A, DIMM_5 Disabled	Major
8545	Memory Board A, DIMM_6 Disabled	Major
8546	Memory Board A, DIMM_7 Disabled	Major
8547	Memory Board A, DIMM_8 Disabled	Major
8548	Memory Board B, DIMM_1 Disabled	Major
8549	Memory Board B, DIMM_2 Disabled	Major
854A	Memory Board B, DIMM_3 Disabled	Major
854B	Memory Board B, DIMM_4 Disabled	Major

Table 10. POST Error Manager Messages and Handling

POST Error Code	POST Error Manager Message	Severity
854C	Memory Board B, DIMM_5 Disabled	Major
854D	Memory Board B, DIMM_6 Disabled	Major
854E	Memory Board B, DIMM_7 Disabled	Major
854F	Memory Board B, DIMM_8 Disabled	Major
8550	Memory Board C, DIMM_1 Disabled	Major
8551	Memory Board C, DIMM_2 Disabled	Major
8552	Memory Board C, DIMM_3 Disabled	Major
8553	Memory Board C, DIMM_4 Disabled	Major
8554	Memory Board C, DIMM_5 Disabled	Major
8555	Memory Board C, DIMM_6 Disabled	Major
8556	Memory Board C, DIMM_7 Disabled	Major
8557	Memory Board C, DIMM_8 Disabled	Major
8558	Memory Board D, DIMM_1 Disabled	Major
8559	Memory Board D, DIMM_2 Disabled	Major
855A	Memory Board D, DIMM_3 Disabled	Major
855B	Memory Board D, DIMM_4 Disabled	Major
855C	Memory Board D, DIMM_5 Disabled	Major
855D	Memory Board D, DIMM_6 Disabled	Major
855E	Memory Board D, DIMM_7 Disabled	Major
855F	Memory Board D, DIMM_8 Disabled	Major
8560	Memory Board A, DIMM_1 Component encountered a Serial Presence Detection (SPD) fail error	Major
8561	Memory Board A, DIMM_2 Component encountered a Serial Presence Detection (SPD) fail error	Major
8562	Memory Board A, DIMM_3 Component encountered a Serial Presence Detection (SPD) fail error	Major
8563	Memory Board A, DIMM_4 Component encountered a Serial Presence Detection (SPD) fail error	Major
8564	Memory Board A, DIMM_5 Component encountered a Serial Presence Detection (SPD) fail error	Major
8565	Memory Board A, DIMM_6 Component encountered a Serial Presence Detection (SPD) fail error	Major

Table 10. POST Error Manager Messages and Handling

POST Error Code	POST Error Manager Message	Severity
8566	Memory Board A, DIMM_7 Component encountered a Serial Presence Detection (SPD) fail error	Major
8567	Memory Board A, DIMM_8 Component encountered a Serial Presence Detection (SPD) fail error	Major
8568	Memory Board B, DIMM_1 Component encountered a Serial Presence Detection (SPD) fail error	Major
8569	Memory Board B, DIMM_2 Component encountered a Serial Presence Detection (SPD) fail error	Major
856A	Memory Board B, DIMM_3 Component encountered a Serial Presence Detection (SPD) fail error	Major
856B	Memory Board B, DIMM_4 Component encountered a Serial Presence Detection (SPD) fail error	Major
856C	Memory Board B, DIMM_5 Component encountered a Serial Presence Detection (SPD) fail error	Major
856D	Memory Board B, DIMM_6 Component encountered a Serial Presence Detection (SPD) fail error	Major
856E	Memory Board B, DIMM_7 Component encountered a Serial Presence Detection (SPD) fail error	Major
856F	Memory Board B, DIMM_8 Component encountered a Serial Presence Detection (SPD) fail error	Major
8570	Memory Board C, DIMM_1 Component encountered a Serial Presence Detection (SPD) fail error	Major
8571	Memory Board C, DIMM_2 Component encountered a Serial Presence Detection (SPD) fail error	Major
8572	Memory Board C, DIMM_3 Component encountered a Serial Presence Detection (SPD) fail error	Major
8573	Memory Board C, DIMM_4 Component encountered a Serial Presence Detection (SPD) fail error	Major
8574	Memory Board C, DIMM_5 Component encountered a Serial Presence Detection (SPD) fail error	Major
8575	Memory Board C, DIMM_6 Component encountered a Serial Presence Detection (SPD) fail error	Major
8576	Memory Board C, DIMM_7 Component encountered a Serial Presence Detection (SPD) fail error	Major
8577	Memory Board C, DIMM_8 Component encountered a Serial Presence Detection (SPD) fail error	Major
8578	Memory Board D, DIMM_1 Component encountered a Serial Presence Detection (SPD) fail error	Major
8579	Memory Board D, DIMM_2 Component encountered a Serial Presence Detection (SPD) fail error	Major

Table 10. POST Error Manager Messages and Handling

POST Error Code	POST Error Manager Message	Severity
857A	Memory Board D, DIMM_3 Component encountered a Serial Presence Detection (SPD) fail error	Major
857B	Memory Board D, DIMM_4 Component encountered a Serial Presence Detection (SPD) fail error	Major
857C	Memory Board D, DIMM_5 Component encountered a Serial Presence Detection (SPD) fail error	Major
857D	Memory Board D, DIMM_6 Component encountered a Serial Presence Detection (SPD) fail error	Major
857E	Memory Board D, DIMM_7 Component encountered a Serial Presence Detection (SPD) fail error	Major
857F	Memory Board D, DIMM_8 Component encountered a Serial Presence Detection (SPD) fail error	Major
8580	Memory Board A, DIMM_1 Correctable ECC error encountered	Minor, Major after 10
8581	Memory Board A, DIMM_2 Correctable ECC error encountered	Minor, Major after 10
8582	Memory Board A, DIMM_3 Correctable ECC error encountered	Minor, Major after 10
8583	Memory Board A, DIMM_4 Correctable ECC error encountered	Minor, Major after 10
8584	Memory Board A, DIMM_5 Correctable ECC error encountered	Minor, Major after 10
8585	Memory Board A, DIMM_6 Correctable ECC error encountered	Minor, Major after 10
8586	Memory Board A, DIMM_7 Correctable ECC error encountered	Minor, Major after 10
8587	Memory Board A, DIMM_8 Correctable ECC error encountered	Minor, Major after 10
8588	Memory Board B, DIMM_1 Correctable ECC error encountered	Minor, Major after 10
8589	Memory Board B, DIMM_2 Correctable ECC error encountered	Minor, Major after 10
858A	Memory Board B, DIMM_3 Correctable ECC error encountered	Minor, Major after 10
858B	Memory Board B, DIMM_4 Correctable ECC error encountered	Minor, Major after 10
858C	Memory Board B, DIMM_5 Correctable ECC error encountered	Minor, Major after 10
858D	Memory Board B, DIMM_6 Correctable ECC error encountered	Minor, Major after 10

Table 10. POST Error Manager Messages and Handling

POST Error Code	POST Error Manager Message	Severity
858E	Memory Board B, DIMM_7 Correctable ECC error encountered	Minor, Major after 10
858F	Memory Board B, DIMM_8 Correctable ECC error encountered	Minor, Major after 10
8590	Memory Board C, DIMM_1 Correctable ECC error encountered	Minor, Major after 10
8591	Memory Board C, DIMM_2 Correctable ECC error encountered	Minor, Major after 10
8592	Memory Board C, DIMM_3 Correctable ECC error encountered	Minor, Major after 10
8593	Memory Board C, DIMM_4 Correctable ECC error encountered	Minor, Major after 10
8594	Memory Board C, DIMM_5 Correctable ECC error encountered	Minor, Major after 10
8595	Memory Board C, DIMM_6 Correctable ECC error encountered	Minor, Major after 10
8596	Memory Board C, DIMM_7 Correctable ECC error encountered	Minor, Major after 10
8597	Memory Board C, DIMM_8 Correctable ECC error encountered	Minor, Major after 10
8598	Memory Board D, DIMM_1 Correctable ECC error encountered	Minor, Major after 10
8599	Memory Board D, DIMM_2 Correctable ECC error encountered	Minor, Major after 10
859A	Memory Board D, DIMM_3 Correctable ECC error encountered	Minor, Major after 10
859B	Memory Board D, DIMM_4 Correctable ECC error encountered	Minor, Major after 10
859C	Memory Board D, DIMM_5 Correctable ECC error encountered	Minor, Major after 10
859D	Memory Board D, DIMM_6 Correctable ECC error encountered	Minor, Major after 10
859E	Memory Board D, DIMM_7 Correctable ECC error encountered	Minor, Major after 10
859F	Memory Board D, DIMM_8 Correctable ECC error encountered	Minor, Major after 10
85A0	Memory Board A, DIMM_1 Uncorrectable ECC error encountered	Major
85A1	Memory Board A, DIMM_2 Uncorrectable ECC error encountered	Major

Table 10. POST Error Manager Messages and Handling

POST Error Code	POST Error Manager Message	Severity
85A2	Memory Board A, DIMM_3 Uncorrectable ECC error encountered	Major
85A3	Memory Board A, DIMM_4 Uncorrectable ECC error encountered	Major
85A4	Memory Board A, DIMM_5 Uncorrectable ECC error encountered	Major
85A5	Memory Board A, DIMM_6 Uncorrectable ECC error encountered	Major
85A6	Memory Board A, DIMM_7 Uncorrectable ECC error encountered	Major
85A7	Memory Board A, DIMM_8 Uncorrectable ECC error encountered	Major
85A8	Memory Board B, DIMM_1 Uncorrectable ECC error encountered	Major
85A9	Memory Board B, DIMM_2 Uncorrectable ECC error encountered	Major
85AA	Memory Board B, DIMM_3 Uncorrectable ECC error encountered	Major
85AB	Memory Board B, DIMM_4 Uncorrectable ECC error encountered	Major
85AC	Memory Board B, DIMM_5 Uncorrectable ECC error encountered	Major
85AD	Memory Board B, DIMM_6 Uncorrectable ECC error encountered	Major
85AE	Memory Board B, DIMM_7 Uncorrectable ECC error encountered	Major
85AF	Memory Board B, DIMM_8 Uncorrectable ECC error encountered	Major
85B0	Memory Board C, DIMM_1 Uncorrectable ECC error encountered	Major
85B1	Memory Board C, DIMM_2 Uncorrectable ECC error encountered	Major
85B2	Memory Board C, DIMM_3 Uncorrectable ECC error encountered	Major
85B3	Memory Board C, DIMM_4 Uncorrectable ECC error encountered	Major
85B4	Memory Board C, DIMM_5 Uncorrectable ECC error encountered	Major
85B5	Memory Board C, DIMM_6 Uncorrectable ECC error encountered	Major

Table 10. POST Error Manager Messages and Handling

POST Error Code	POST Error Manager Message	Severity
85B6	Memory Board C, DIMM_7 Uncorrectable ECC error encountered	Major
85B7	Memory Board C, DIMM_8 Uncorrectable ECC error encountered	Major
85B8	Memory Board D, DIMM_1 Uncorrectable ECC error encountered	Major
85B9	Memory Board D, DIMM_2 Uncorrectable ECC error encountered	Major
85BA	Memory Board D, DIMM_3 Uncorrectable ECC error encountered	Major
85BB	Memory Board D, DIMM_4 Uncorrectable ECC error encountered	Major
85BC	Memory Board D, DIMM_5 Uncorrectable ECC error encountered	Major
85BD	Memory Board D, DIMM_6 Uncorrectable ECC error encountered	Major
85BE	Memory Board D, DIMM_7 Uncorrectable ECC error encountered	Major
85BF	Memory Board D, DIMM_8 Uncorrectable ECC error encountered	Major
85FC	Closed Loop Thermal Throttling could not be configured, defaulting to Open Loop	Major
85FD	Memory was not configured for the selected Memory RAS Configuration	Minor
8601	System booting from the other bank. Recovery jumper is set to recovery mode	Minor
8602	WatchDog timer expired (secondary BIOS may be bad!)	Minor
8603	Secondary BIOS checksum fail	Minor
9000	Unspecified processor component has encountered a non specific error	Major
9223	Keyboard component was not detected	Minor
9226	Keyboard component encountered a controller error	Minor
9243	Mouse component was not detected	Minor
9246	Mouse component encountered a controller error	Minor
9266	Local Console component encountered a controller error	Minor

Table 10. POST Error Manager Messages and Handling

POST Error Code	POST Error Manager Message	Severity
9268	Local Console component encountered an output error	Minor
9269	Local Console component encountered a resource conflict error	Minor
9286	Remote Console component encountered a controller error	Minor
9287	Remote Console component encountered an input error	Minor
9288	Remote Console component encountered an output error	Minor
92A3	Serial port component was not detected	Major
92A9	Serial port component encountered a resource conflict error	Major
92C6	Serial Port controller error	Minor
92C7	Serial Port component encountered an input error	Minor
92C8	Serial Port component encountered an output error	Minor
94C6	LPC component encountered a controller error	Minor
94C9	LPC component encountered a resource conflict error	Minor
9506	ATA/ATPI component encountered a controller error	Minor
95A6	PCI component encountered a controller error	Minor
95A7	PCI component encountered a read error	Minor
95A8	PCI component encountered a write error	Minor
9609	Unspecified software component encountered a start error	Minor
9641	PEI Core component encountered a load error	Minor
9667	PEI module component encountered a illegal software state error	Fatal
9687	DXE core component encountered a illegal software state error	Fatal
96A7	DXE boot services driver component encountered a illegal software state error	Fatal
96AB	DXE boot services driver component encountered invalid configuration	Minor
96E7	SMM driver component encountered a illegal software state error	Fatal

Table 10. POST Error Manager Messages and Handling

POST Error Code	POST Error Manager Message	Severity
A000	TPM device not detected	Minor
A001	TPM device missing or not responding	Minor
A002	TPM device failure	Minor
A003	TPM device failed self test	Minor
A022	Processor component encountered a mismatch error	Major
A027	Processor component encountered a low voltage error	Minor
A028	Processor component encountered a high voltage error	Minor
A421	PCI component encountered a SERR error	Fatal
A500	ATA/ATPI ATA bus SMART not supported	Minor
A501	ATA/ATPI ATA SMART is disabled	Minor
A5A0	PCI Express component encountered a PERR error	Minor
A5A1	PCI Express component encountered a SERR error	Fatal
A5A4	PCI Express IBIST error	Major
A6A0	DXE boot services driver Not enough memory available to shadow a legacy option ROM	Minor

POST Error Beep Codes

The following table lists POST error beep codes. Prior to system video initialization, the BIOS uses beep codes to inform users on error conditions. The beep code is followed by a user visible code on POST Progress LEDs.

Table 11. Beep Codes

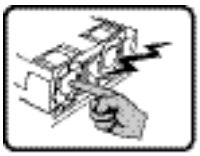
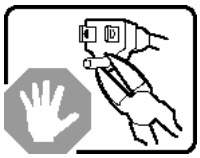
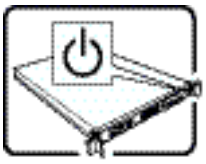
Beeps	Error Message	Description
3	Memory error	System halted because a fatal error related to the memory was detected.
6	BIOS rolling back error	The system has detected a corrupted BIOS in the flash part, and is rolling back to the last good BIOS.
1-5-2-1		CPU: Empty slot / population error.

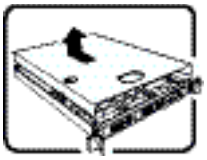
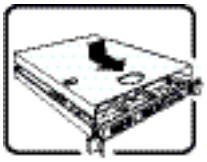
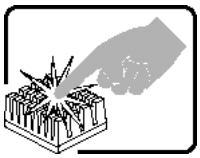
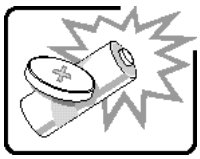
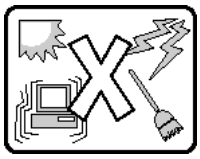
Table 11. Beep Codes

Beeps	Error Message	Description
1-5-4-2		Power fault: DC power unexpectedly lost (power good dropout)
1-5-4-4		Power control fault (Power good assertion timeout)

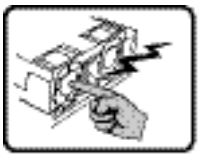
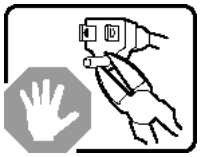
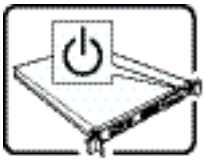
Appendix B: Installation / Assembly Safety Instructions

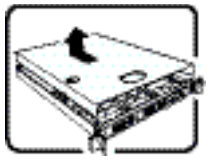
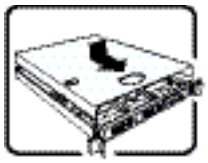
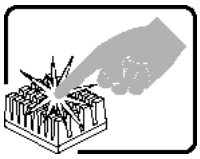
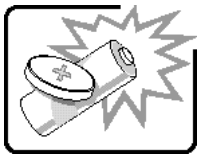
English

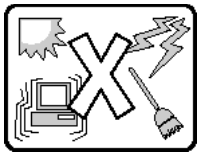
	The power supply in this product contains no user-serviceable parts. Refer servicing only to qualified personnel.
	Do not attempt to modify or use the supplied AC power cord if it is not the exact type required. A product with more than one power supply will have a separate AC power cord for each supply.
	The power button on the system does not turn off system AC power. To remove AC power from the system, you must unplug each AC power cord from the wall outlet or power supply. The power cord(s) is considered the disconnect device to the main (AC) power. The socket outlet that the system plugs into shall be installed near the equipment and shall be easily accessible.
	**SAFETY STEPS:** Whenever you remove the chassis covers to access the inside of the system, follow these steps: 1. Turn off all peripheral devices connected to the system. 2. Turn off the system by pressing the power button. 3. Unplug all AC power cords from the system or from wall outlets. 4. Label and disconnect all cables connected to I/O connectors or ports on the back of the system. 5. Provide some electrostatic discharge (ESD) protection by wearing an antistatic wrist strap attached to chassis ground of the system-any unpainted metal surface-when handling components. 6. Do not operate the system with the chassis covers removed.

	After you have completed the six SAFETY steps above, you can remove the system covers. To do this: 1. Unlock and remove the padlock from the back of the system if a padlock has been installed. 2. Remove and save all screws from the covers. 3. Remove the cover(s).
	For proper cooling and airflow, always reinstall the chassis covers before turning on the system. Operating the system without the covers in place can damage system parts. To install the covers: 1. Check first to make sure you have not left loose tools or parts inside the system. 2. Check that cables, add-in cards, and other components are properly installed. 3. Attach the covers to the chassis with the screws removed earlier, and tighten them firmly. 4. Insert and lock the padlock to the system to prevent unauthorized access inside the system. 5. Connect all external cables and the AC power cord(s) to the system.
	A microprocessor and heat sink may be hot if the system has been running. Also, there may be sharp pins and edges on some board and chassis parts. Contact should be made with care. Consider wearing protective gloves.
	Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Dispose of used batteries according to manufacturer's instructions.
	The system is designed to operate in a typical office environment. Choose a site that is: • Clean and free of airborne particles (other than normal room dust). • Well ventilated and away from sources of heat including direct sunlight. • Away from sources of vibration or physical shock. • Isolated from strong electromagnetic fields produced by electrical devices. • In regions that are susceptible to electrical storms, we recommend you plug your system into a surge suppressor and disconnect telecommunication lines to your modem during an electrical storm. • Provided with a properly grounded wall outlet. • Provided with sufficient space to access the power supply cord(s), because they serve as the product's main power disconnect.

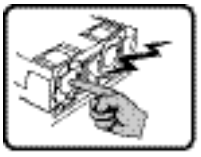
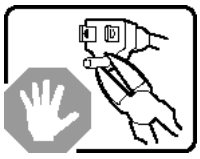
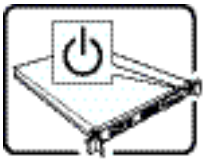
Deutsch

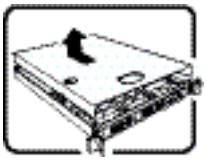
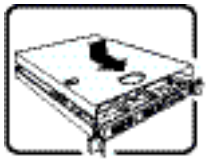
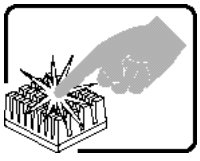
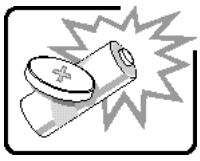
	Benutzer können am Netzgerät dieses Produkts keine Reparaturen vornehmen. Das Produkt enthält möglicherweise mehrere Netzgeräte. Wartungsarbeiten müssen von qualifizierten Technikern ausgeführt werden.
	Versuchen Sie nicht, das mitgelieferte Netzkabel zu ändern oder zu verwenden, wenn es sich nicht genau um den erforderlichen Typ handelt. Ein Produkt mit mehreren Netzgeräten hat für jedes Netzgerät ein eigenes Netzkabel.
	Der Wechselstrom des Systems wird durch den Ein-/Aus-Schalter für Gleichstrom nicht ausgeschaltet. Ziehen Sie jedes Wechselstrom-Netzkabel aus der Steckdose bzw. dem Netzgerät, um den Stromanschluß des Systems zu unterbrechen.
	SICHERHEISMASSNAHMEN: Immer wenn Sie die Gehäuseabdeckung abnehmen um an das Systeminnere zu gelangen, sollten Sie folgende Schritte beachten: 1. Schalten Sie alle an Ihr System angeschlossenen Peripheriegeräte aus. 2. Schalten Sie das System mit dem Hauptschalter aus. 3. Ziehen Sie den Stromanschlußstecker Ihres Systems aus der Steckdose. 4. Auf der Rückseite des Systems beschriften und ziehen Sie alle Anschlußkabel von den I/O Anschlüssen oder Ports ab. 5. Tragen Sie ein geerdetes Antistatik Gelenkband, um elektrostatische Ladungen (ESD) über blanke Metallstellen bei der Handhabung der Komponenten zu vermeiden. 6. Schalten Sie das System niemals ohne ordnungsgemäß montiertes Gehäuse ein.

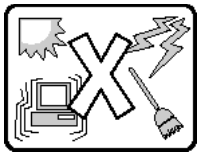
	SICHERHEISMASSNAHMEN: Immer wenn Sie die Gehäuseabdeckung abnehmen um an das Systeminnere zu gelangen, sollten Sie folgende Schritte beachten: 1. Schalten Sie alle an Ihr System angeschlossenen Peripheriegeräte aus. 2. Schalten Sie das System mit dem Hauptschalter aus. 3. Ziehen Sie den Stromanschlußstecker Ihres Systems aus der Steckdose. 4. Auf der Rückseite des Systems beschriften und ziehen Sie alle Anschlußkabel von den I/O Anschlüssen oder Ports ab. 5. Tragen Sie ein geerdetes Antistatik Gelenkband, um elektrostatische Ladungen (ESD) über blanke Metallstellen bei der Handhabung der Komponenten zu vermeiden. 6. Schalten Sie das System niemals ohne ordnungsgemäß montiertes Gehäuse ein.
	Zur ordnungsgemäßen Kühlung und Lüftung muß die Gehäuseabdeckung immer wieder vor dem Einschalten installiert werden. Ein Betrieb des Systems ohne angebrachte Abdeckung kann Ihrem System oder Teile darin beschädigen. Um die Abdeckung wieder anzubringen: 1. Vergewissern Sie sich, daß Sie keine Werkzeuge oder Teile im Innern des Systems zurückgelassen haben. 2. Überprüfen Sie alle Kabel, Zusatzkarten und andere Komponenten auf ordnungsgemäßen Sitz und Installation. 3. Bringen Sie die Abdeckungen wieder am Gehäuse an, indem Sie die zuvor gelösten Schrauben wieder anbringen. Ziehen Sie diese gut an. 4. Bringen Sie die Verschlußeinrichtung (Padlock) wieder an und schließen Sie diese, um ein unerlaubtes Öffnen des Systems zu verhindern. 5. Schließen Sie alle externen Kabel und den AC Stromanschlußstecker Ihres Systems wieder an.
	Der Mikroprozessor und der Kühler sind möglicherweise erhitzt, wenn das System in Betrieb ist. Außerdem können einige Platinen und Gehäuseteile scharfe Spitzen und Kanten aufweisen. Arbeiten an Platinen und Gehäuse sollten vorsichtig ausgeführt werden. Sie sollten Schutzhandschuhe tragen.
	Bei falschem Einsetzen einer neuen Batterie besteht Explosionsgefahr. Die Batterie darf nur durch denselben oder einen entsprechenden, vom Hersteller empfohlenen Batterietyp ersetzt werden. Entsorgen Sie verbrauchte Batterien den Anweisungen des Herstellers entsprechend.

	Das System wurde für den Betrieb in einer normalen Büroumgebung entwickelt. Der Standort sollte: • sauber und staubfrei sein (Hausstaub ausgenommen); • gut gelüftet und keinen Heizquellen ausgesetzt sein (einschließlich direkter Sonneneinstrahlung); • keinen Erschütterungen ausgesetzt sein; • keine starken, von elektrischen Geräten erzeugten elektromagnetischen Felder aufweisen; • in Regionen, in denen elektrische Stürme auftreten, mit einem Überspannungsschutzgerät verbunden sein; während eines elektrischen Sturms sollte keine Verbindung der Telekommunikationsleitungen mit dem Modem bestehen; • mit einer geerdeten Wechselstromsteckdose ausgerüstet sein; • über ausreichend Platz verfügen, um Zugang zu den Netzkabeln zu gewährleisten, da der Stromanschluß des Produkts hauptsächlich über die Kabel unterbrochen wird

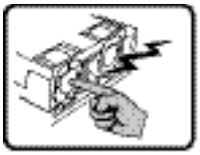
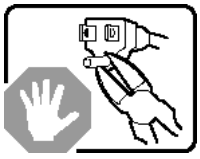
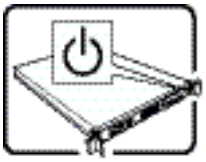
Français

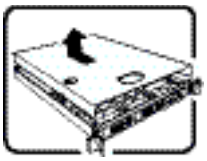
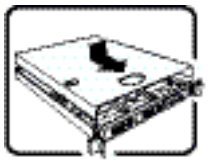
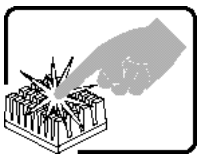
	Le bloc d'alimentation de ce produit ne contient aucune pièce pouvant être réparée par l'utilisateur. Ce produit peut contenir plus d'un bloc d'alimentation. Veuillez contacter un technicien qualifié en cas de problème.
	Ne pas essayer d'utiliser ni modifier le câble d'alimentation CA fourni, s'il ne correspond pas exactement au type requis. Le nombre de câbles d'alimentation CA fournis correspond au nombre de blocs d'alimentation du produit
	Notez que le commutateur CC de mise sous tension /hors tension du panneau avant n'éteint pas l'alimentation CA du système. Pour mettre le système hors tension, vous devez débrancher chaque câble d'alimentation de sa prise.

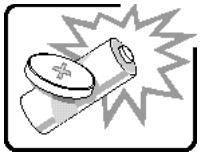
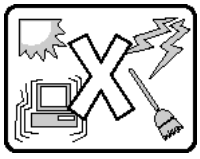
	CONSIGNES DE SÉCURITÉ -Lorsque vous ouvrez le boîtier pour accéder à l'intérieur du système, suivez les consignes suivantes: 1. Mettez hors tension tous les périphériques connectés au système. 2. Mettez le système hors tension en mettant l'interrupteur général en position OFF (bouton-poussoir). 3. Débranchez tous les cordons d'alimentation c.a. du système et des prises murales. 4. Identifiez et débranchez tous les câbles reliés aux connecteurs d'E-S ou aux accès derrière le système. 5. Pour prévenir les décharges électrostatiques lorsque vous touchez aux composants, portez une bande antistatique pour poignet et reliez-la à la masse du système (toute surface métallique non peinte du boîtier). 6. Ne faites pas fonctionner le système tandis que le boîtier est ouvert.
	Une fois TOUTES les étapes précédentes accomplies, vous pouvez retirer les panneaux du système. Procédez comme suit: 1. Si un cadenas a été installé sur à l'arrière du système, déverrouillez-le et retirez-le. 2. Retirez toutes les vis des panneaux et mettez-les dans un endroit sûr. 3. Retirez les panneaux.
	Afin de permettre le refroidissement et l'aération du système, réinstallez toujours les panneaux du boîtier avant de mettre le système sous tension. Le fonctionnement du système en l'absence des panneaux risque d'endommager ses pièces. Pour installer les panneaux, procédez comme suit: 1. Assurez-vous de ne pas avoir oublié d'outils ou de pièces démontées dans le système. 2. Assurez-vous que les câbles, les cartes d'extension et les autres composants sont bien installés. 3. Revissez solidement les panneaux du boîtier avec les vis retirées plus tôt. 4. Remettez le cadenas en place et verrouillez-le afin de prévenir tout accès non autorisé à l'intérieur du système. 5. Rebranchez tous les cordons d'alimentation c. a. et câbles externes au système.
	Le microprocesseur et le dissipateur de chaleur peuvent être chauds si le système a été sous tension. Faites également attention aux broches aiguës des cartes et aux bords tranchants du capot. Nous vous recommandons l'usage de gants de protection.
	Danger d'explosion si la batterie n'est pas remontée correctement. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le fabricant. Disposez des piles usées selon les instructions du fabricant.

	Le système a été conçu pour fonctionner dans un cadre de travail normal. L'emplacement choisi doit être: • Propre et dépourvu de poussière en suspension (sauf la poussière normale). • Bien aéré et loin des sources de chaleur, y compris du soleil direct. • A l'abri des chocs et des sources de vibrations. • Isolé de forts champs électromagnétiques géenérés par des appareils électriques. • Dans les régions sujettes aux orages magnétiques il est recomandé de brancher votre système à un supresseur de surtension, et de débrancher toutes les lignes de télécommunications de votre modem durant un orage. • Muni d'une prise murale correctement mise à la terre. • Suffisamment spacieux pour vous permettre d'accéder aux câbles d'alimentation (ceux-ci étant le seul moyen de mettre le système hors tension).

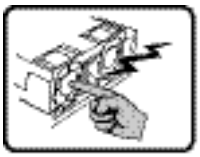
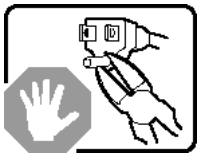
Español

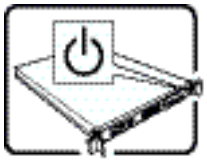
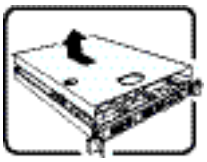
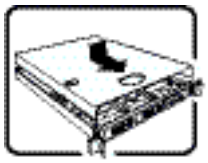
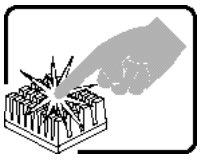
	El usuario debe abstenerse de manipular los componentes de la fuente de alimentación de este producto, cuya reparación debe dejarse exclusivamente en manos de personal técnico especializado. Puede que este producto disponga de más de una fuente de alimentación
	No intente modificar ni usar el cable de alimentación de corriente alterna, si no corresponde exactamente con el tipo requerido. El número de cables suministrados se corresponden con el número de fuentes de alimentación de corriente alterna que tenga el producto
	Nótese que el interruptor activado / desactivado en el panel frontal no desconecta la corriente alterna del sistema. Para desconectarla, deberá desenchufar todos los cables de corriente alterna de la pared o desconectar la fuente de alimentación.

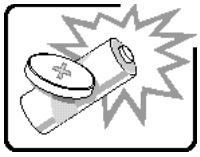
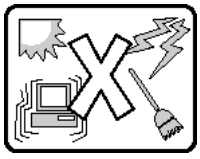
	INSTRUCCIONES DE SEGURIDAD: Cuando extraiga la tapa del chasis para acceder al interior del sistema, siga las siguientes instrucciones: 1. Apague todos los dispositivos periféricos conectados al sistema. 2. Apague el sistema presionando el interruptor encendido / apagado. 3. Desconecte todos los cables de alimentación CA del sistema o de las tomas de corriente alterna. 4. Identifique y desconecte todos los cables enchufados a los conectores E/S o a los puertos situados en la parte posterior del sistema. 5. Cuando manipule los componentes, es importante protegerse contra la descarga electrostática (ESD). Puede hacerlo si utiliza una muñequera antiestática sujetada a la toma de tierra del chasis - o a cualquier tipo de superficie de metal sin pintar. 6. No ponga en marcha el sistema si se han extraído las tapas del chasis.
	Después de completar las seis instrucciones de SEGURIDAD mencionadas, ya puede extraer las tapas del sistema. Para ello: 1. Desbloquee y extraiga el bloqueo de seguridad de la parte posterior del sistema, si se ha instalado uno. 2. Extraiga y guarde todos los tornillos de las tapas.Extraiga las tapas.
	Para obtener un enfriamiento y un flujo de aire adecuados, reinstale siempre las tapas del chasis antes de poner en marcha el sistema. Si pone en funcionamiento el sistema sin las tapas bien colocadas puede dañar los componentes del sistema. Para instalar las tapas: 1. Asegúrese primero de no haber dejado herramientas o componentes sueltos dentro del sistema. 2. Compruebe que los cables, las placas adicionales y otros componentes se hayan instalado correctamente. 3. Incorpore las tapas al chasis mediante los tornillos extraídos anteriormente, tensándolos firmemente. 4. Inserte el bloqueo de seguridad en el sistema y bloquéelo para impedir que pueda accederse al mismo sin autorización. 5. Conecte todos los cables externos y los cables de alimentación CA al sistema.
	Si el sistema ha estado en funcionamiento, el microprocesador y el disipador de calor pueden estar aún calientes. También conviene tener en cuenta que en el chasis o en el tablero puede haber piezas cortantes o punzantes. Por ello, se recomienda precaución y el uso de guantes protectores.

	Existe peligro de explosión si la pila no se cambia de forma adecuada. Utilice solamente pilas iguales o del mismo tipo que las recomendadas por el fabricante del equipo. Para deshacerse de las pilas usadas, siga igualmente las instrucciones del fabricante.
	El sistema está diseñado para funcionar en un entorno de trabajo normal. Escoja un lugar: • Limpio y libre de partículas en suspensión (salvo el polvo normal). • Bien ventilado y alejado de fuentes de calor, incluida la luz solar directa. • Alejado de fuentes de vibración. • Aislado de campos electromagnéticos fuertes producidos por dispositivos eléctricos. • En regiones con frecuentes tormentas eléctricas, se recomienda conectar su sistema a un eliminador de sobrevoltage y desconectar el módem de las líneas de telecomunicación durante las tormentas. • Provisto de una toma de tierra correctamente instalada. • Provisto de espacio suficiente como para acceder a los cables de alimentación, ya que éstos hacen de medio principal de desconexión del sistema.

Italiano

	Rivolgersi ad un tecnico specializzato per la riparazione dei componenti dell'alimentazione di questo prodotto. È possibile che il prodotto disponga di più fonti di alimentazione.
	Non modificare o utilizzare il cavo di alimentazione in c.a. fornito dal produttore, se non corrisponde esattamente al tipo richiesto. Ad ogni fonte di alimentazione corrisponde un cavo di alimentazione in c.a. separato

	L'interruttore attivato / disattivato nel pannello anteriore non interrompe l'alimentazione in c.a. del sistema. Per interromperla, è necessario scollegare tutti i cavi di alimentazione in c.a. dalle prese a muro o dall'alimentazione di corrente.
	PASSI DI SICUREZZA: Qualora si rimuovano le coperture del telaio per accedere all'interno del sistema, seguire i seguenti passi: 1. Spegnere tutti i dispositivi periferici collegati al sistema. 2. Spegnere il sistema, usando il pulsante spento / acceso dell'interruttore del sistema. 3. Togliere tutte le spine dei cavi del sistema dalle prese elettriche. 4. Identificare e sconnettere tutti i cavi attaccati ai collegamenti I/O od alle prese installate sul retro del sistema. 5. Qualora si tocchino i componenti, proteggersi dallo scarico elettrostatico (SES), portando un cinghia anti-statica da polso che è attaccata alla presa a terra del telaio del sistema - qualsiasi superficie non dipinta - . 6. Non far operare il sistema quando il telaio è senza le coperture.
	Dopo aver seguito i sei passi di SICUREZZA sopracitati, togliere le coperture del telaio del sistema come seque: 1. Aprire e rimuovere il lucchetto dal retro del sistema qualora ve ne fosse uno installato. 2. Togliere e mettere in un posto sicuro tutte le viti delle coperture. 3. Togliere le coperture.
	Per il giusto flusso dell'aria e raffreddamento del sistema, rimettere sempre le coperture del telaio prima di riaccendere il sistema. Operare il sistema senza le coperture al loro proprio posto potrebbe danneggiare i componenti del sistema. Per rimettere le coperture del telaio: 1. Controllare prima che non si siano lasciati degli attrezzi o dei componenti dentro il sistema. 2. Controllare che i cavi, dei supporti aggiuntivi ed altri componenti siano stati installati appropriatamente. 3. Attaccare le coperture al telaio con le viti tolte in precedenza e avvitarle strettamente. 4. Inserire e chiudere a chiave il lucchetto sul retro del sistema per impedire l'accesso non autorizzato al sistema. 5. Ricollegare tutti i cavi esterni e le prolunghe AC del sistema.
	Se il sistema è stato a lungo in funzione, il microprocessore e il dissipatore di calore potrebbero essere surriscaldati. Fare attenzione alla presenza di piedini appuntiti e parti taglienti sulle schede e sul telaio. È consigliabile l'uso di guanti di protezione.

	Esiste il pericolo di un esplosione se la pila non viene sostituita in modo corretto. Utilizzare solo pile uguali o di tipo equivalente a quelle consigliate dal produttore. Per disfarsi delle pile usate, seguire le istruzioni del produttore.
	Il sistema è progettato per funzionare in un ambiente di lavoro tipo. Scegliere una postazione che sia: • Pulita e libera da particelle in sospensione (a parte la normale polvere presente nell'ambiente). • Ben ventilata e lontana da fonti di calore, compresa la luce solare diretta. • Al riparo da urti e lontana da fonti di vibrazione. • Isolata dai forti campi magnetici prodotti da dispositivi elettrici. • In aree soggette a temporali, è consigliabile collegare il sistema ad un limitatore di corrente. In caso di temporali, scollegare le linee di comunicazione dal modem. • Dotata di una presa a muro correttamente installata. • Dotata di spazio sufficiente ad accedere ai cavi di alimentazione, i quali rappresentano il mezzo principale di scollegamento del sistema.

Appendix C: Safety Information

English

Server Safety Information

This document applies to Intel® server boards, Intel® server chassis (pedestal and rack-mount) and installed peripherals. To reduce the risk of bodily injury, electrical shock, fire, and equipment damage, read this document and observe all warnings and precautions in this guide before installing or maintaining your Intel® server product.

In the event of a conflict between the information in this document and information provided with the product or on the website for a particular product, the product documentation takes precedence.

Your server should be integrated and serviced only by technically qualified persons.

You must adhere to the guidelines in this guide and the assembly instructions in your server manuals to ensure and maintain compliance with existing product certifications and approvals. Use only the described, regulated components specified in this guide. Use of other products / components will void the UL Listing and other regulatory approvals of the product, and may result in noncompliance with product regulations in the region(s) in which the product is sold.

Safety Warnings and Cautions

To avoid personal injury or property damage, before you begin installing the product, read, observe, and adhere to all of the following safety instructions and information. The following safety symbols may be used throughout the documentation and may be marked on the product and / or the product packaging.

CAUTION	Indicates the presence of a hazard that may cause minor personal injury or property damage if the CAUTION is ignored.
WARNING	Indicates the presence of a hazard that may result in serious personal injury if the WARNING is ignored.
	Indicates potential hazard if indicated information is ignored.
	Indicates shock hazards that result in serious injury or death if safety instructions are not followed.

	Indicates hot components or surfaces.
	Indicates do not touch fan blades, may result in injury.
	Indicates to unplug all AC power cord(s) to disconnect AC power
	Please recycle battery

Intended Application Uses

This product was evaluated as Information Technology Equipment (ITE), which may be installed in offices, schools, computer rooms, and similar commercial type locations. The suitability of this product for other product categories and environments (such as medical, industrial, residential, alarm systems, and test equipment), other than an ITE application, may require further evaluation.

Site Selection

The system is designed to operate in a typical office environment. Choose a site that is:

- Clean, dry, and free of airborne particles (other than normal room dust).
- Well-ventilated and away from sources of heat including direct sunlight and radiators.
- Away from sources of vibration or physical shock.
- Isolated from strong electromagnetic fields produced by electrical devices.
- In regions that are susceptible to electrical storms, we recommend you plug your system into a surge suppressor and disconnect telecommunication lines to your modem during an electrical storm.
- Provided with a properly grounded wall outlet.
- Provided with sufficient space to access the power supply cord(s), because they serve as the product's main power disconnect.

Equipment Handling Practices

Reduce the risk of personal injury or equipment damage:

- Conform to local occupational health and safety requirements when moving and lifting equipment.
- Use mechanical assistance or other suitable assistance when moving and lifting equipment.
- To reduce the weight for easier handling, remove any easily detachable components.

Power and Electrical Warnings

Caution: *The power button, indicated by the stand-by power marking, DOES NOT completely turn off the system AC power, 5V standby power is active whenever the system is plugged in. To remove power from system, you must unplug the AC power cord from the wall outlet. Your system may use more than one AC power cord. Make sure all AC power cords are unplugged. Make sure the AC power cord(s) is / are unplugged before you open the chassis, or add or remove any non hot-plug components.*

Do not attempt to modify or use an AC power cord if it is not the exact type required. A separate AC cord is required for each system power supply.

Some power supplies in Intel® servers use Neutral Pole Fusing. To avoid risk of shock use caution when working with power supplies that use Neutral Pole Fusing.

The power supply in this product contains no user-serviceable parts. Do not open the power supply. Hazardous voltage, current and energy levels are present inside the power supply. Return to manufacturer for servicing.

When replacing a hot-plug power supply, unplug the power cord to the power supply being replaced before removing it from the server.

To avoid risk of electric shock, turn off the server and disconnect the power cord, telecommunications systems, networks, and modems attached to the server before opening it.

Power Cord Warnings

If an AC power cord was not provided with your product, purchase one that is approved for use in your country.

Caution: *To avoid electrical shock or fire, check the power cord(s) that will be used with the product as follows:*

- *Do not attempt to modify or use the AC power cord(s) if they are not the exact type required to fit into the grounded electrical outlets*
- *The power cord(s) must meet the following criteria:*
- *The power cord must have an electrical rating that is greater than that of the electrical current rating marked on the product.*

- *The power cord must have safety ground pin or contact that is suitable for the electrical outlet.*
- *The power supply cord(s) is / are the main disconnect device to AC power. The socket outlet(s) must be near the equipment and readily accessible for disconnection.*

- *The power supply cord(s) must be plugged into socket-outlet(s) that is / are provided with a suitable earth ground.*

System Access Warnings

Caution: *To avoid personal injury or property damage, the following safety instructions apply whenever accessing the inside of the product:*

- *Turn off all peripheral devices connected to this product.*
- *Turn off the system by pressing the power button to off.*
- *Disconnect the AC power by unplugging all AC power cords from the system or wall outlet.*
- *Disconnect all cables and telecommunication lines that are connected to the system.*
- *Retain all screws or other fasteners when removing access cover(s). Upon completion of accessing inside the product, refasten access cover with original screws or fasteners.*
- *Do not access the inside of the power supply. There are no serviceable parts in the power supply. Return to manufacturer for servicing.*
- *Power down the server and disconnect all power cords before adding or replacing any non hot-plug component.*

- *When replacing a hot-plug power supply, unplug the power cord to the power supply being replaced before removing the power supply from the server.*

Caution: *If the server has been running, any installed processor(s) and heat sink(s) may be hot. Unless you are adding or removing a hot-plug component, allow the system to cool before opening the covers. To avoid the possibility of coming into contact with hot component(s) during a hot-plug installation, be careful when removing or installing the hot-plug component(s).*

Caution: *To avoid injury do not contact moving fan blades. If your system is supplied with a guard over the fan, do not operate the system without the fan guard in place.*

Rack Mount Warnings

Note: *The following installation guidelines are required by UL for maintaining safety compliance when installing your system into a rack.*

The equipment rack must be anchored to an unmovable support to prevent it from tipping when a server or piece of equipment is extended from it. The equipment rack must be installed according to the rack manufacturer's instructions.

Install equipment in the rack from the bottom up, with the heaviest equipment at the bottom of the rack.

Extend only one piece of equipment from the rack at a time.

You are responsible for installing a main power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire unit, not just to the server(s).

To avoid risk of potential electric shock, a proper safety ground must be implemented for the rack and each piece of equipment installed in it.

Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Electrostatic Discharge (ESD)

Caution: *ESD can damage drives, boards, and other parts. We recommend that you perform all procedures at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground -- any unpainted metal surface -- on your server when handling parts.*

Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges. After removing a board from its protective wrapper or from the server,

place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

Other Hazards

Battery Replacement

Caution: *There is the danger of explosion if the battery is incorrectly replaced. When replacing the battery, use only the battery recommended by the equipment manufacturer.*

Dispose of batteries according to local ordinances and regulations.

Do not attempt to recharge a battery.

Do not attempt to disassemble, puncture, or otherwise damage a battery.

Cooling and Airflow

Caution: *Carefully route cables as directed to minimize airflow blockage and cooling problems.*

For proper cooling and airflow, operate the system only with the chassis covers installed. Operating the system without the covers in place can damage system parts. To install the covers:

- *Check first to make sure you have not left loose tools or parts inside the system.*
- *Check that cables, add-in cards, and other components are properly installed.*
- *Attach the covers to the chassis according to the product instructions.*

Laser Peripherals or Devices

Caution: *To avoid risk of radiation exposure and / or personal injury:*

- *Do not open the enclosure of any laser peripheral or device*
- *Laser peripherals or devices have are not user serviceable*
- *Return to manufacturer for servicing*

Deutsch

Sicherheitshinweise für den Server

Das vorliegende Dokument bezieht sich auf Intel® Serverplatinen, Intel® Servergehäuse (Standfuß und Rack) sowie installierte Peripheriegeräte. Es enthält Warnungen und Vorsichtsmaßnahmen zur Vermeidung von Gefahren durch Verletzung, Stromschlag, Feuer und Beschädigungen von Geräten. Lesen Sie diese Dokument daher sorgfältig, bevor Sie Ihr Intel® Serverprodukt installieren oder warten.

Bei Widersprüchen zwischen den hier vorliegenden Angaben und den Informationen im Lieferumfang des Produkts oder auf der Website des betreffenden Produkts hat die Produktdokumentation Vorrang.

Die Integration und Wartung des Servers darf nur durch technisch qualifizierte Personen erfolgen.

Um die Einhaltung der vorhandenen Zulassungen und Genehmigungen für das Produkt zu gewährleisten, sind die Richtlinien in diesem Handbuch sowie die Montageanleitungen in den Serverhandbüchern zu beachten. Verwenden Sie nur die beschriebenen, zugelassenen Komponenten, die im vorliegenden Handbuch angegeben werden. Die Verwendung anderer Produkte oder Komponenten führt zum Erlöschen der UL-Zulassung und anderer Genehmigungen für das Produkt. Dadurch kann das Produkt gegen Produktbestimmungen verstoßen, die im Verkaufsland gelten.

Sicherheitshinweise und Vorsichtsmaßnahmen

Um Verletzungen und Beschädigungen zu vermeiden, sollten Sie vor dem Beginn der Produktinstallation die nachfolgend aufgeführten Sicherheitshinweise und -informationen sorgfältig lesen und befolgen. In dem vorliegenden Handbuch sowie auf dem Produkt und auf der Verpackung werden folgende Sicherheitssymbole verwendet:

VORSICHT	Weist auf eine Gefahrenquelle hin, die bei Nichtbeachtung des VORSICHTSHINWEISES zu leichteren Verletzungen bzw. Sachbeschädigungen führen kann.
WARNUNG	Weist auf eine Gefahrenquelle hin, die bei Nichtbeachtung der WARNUNG zu ernsten Verletzungen führen kann.
	Weist auf potentielle Gefahr bei Nichtbeachtung der angezeigten Informationen hin.
	Weist auf die Gefahr eines Stromschlags hin, der bei Nichtbeachtung der Sicherheitshinweise zu schweren oder tödlichen Verletzungen führen kann.
	Weist auf Verbrennungsgefahr an heißen Bauteilen bzw. Oberflächen hin.

	Weist darauf hin, daß das Anfassen des Gebläses zu Verletzungen führen kann.
	Bedeutet, alle Netzkabel abzuziehen und das Gerät von der Netzspannung zu trennen.
	Bereiten Sie bitte Batterie auf

Zielbenutzer der Anwendung

Dieses Produkt wurde in seiner Eigenschaft als IT-Gerät getestet, das in Büros, Schulen, Computerräumen und ähnlichen öffentlichen Räumlichkeiten installiert werden kann. Die Eignung dieses Produkts für andere Einsatzbereiche als IT (z. B. Medizin, Industrie, Alarmsysteme oder Prüfgeräte) kann u. U. weitere Tests erfordern.

Standortauswahl

Das System ist für den Betrieb innerhalb normaler Büroumgebungen geeignet. Wählen Sie einen Standort, der folgenden Kriterien entspricht:

- Sauber, trocken und frei von Partikeln in der Luft (außer dem normalen Raumstaub).
- Gut belüftet, nicht in der Nähe von Wärmequellen und keiner direkten Sonnenbestrahlung ausgesetzt.
- Nicht in der Nähe von Vibrations oder Erschütterungsquellen.
- Abgeschirmt von starken elektromagnetischen Feldern, die durch elektrische Geräte erzeugt werden.
- In gewittergefährdeten Gebieten sollten Sie das System an einen Überspannungsschutz anschließen und bei einem Gewitter die Telekommunikationskabel zum Modem abziehen.
- Eine ordnungsgemäß geerdete Wandsteckdose muß vorhanden sein.
- Ausreichender Freiraum für den Zugang zu den Netzkabeln, da diese die Hauptvorrichtung zum Trennen des Produkts von der Stromversorgung sind.

Handhabung von Geräten

Beachten Sie zur Vermeidung von Verletzungen oder Beschädigungen an den Geräten die folgenden Hinweise:

- Halten Sie beim Transportieren und Anheben von Geräten die örtlichen Gesundheits und Sicherheitsvorschriften ein.
- Verwenden Sie mechanische oder andere geeignete Hilfsmittel zum Transportieren oder Anheben von Geräten.
- Entfernen Sie alle Komponenten, die sich leicht abnehmen lassen, um das Gewicht zu reduzieren und die Handhabung zu erleichtern.

Warnungen zu Netzspannung und Elektrizität

Vorsicht: *Durch Betätigen der mit dem Standby-Symbol gekennzeichneten Netztaste wird das System NICHT vollständig vom Netz getrennt. Es sind weiterhin 5 V aktiv, solange das System eingesteckt ist. Um das System vollständig vom Strom zu trennen, muß das Netzkabel aus der Steckdose abgezogen werden. Das System verfügt möglicherweise über mehrere Netzkabel. Vergewissern Sie sich in diesem Fall, daß alle Netzkabel abgezogen sind. Wenn Sie Komponenten ein- oder ausbauen möchten, die nicht hot-plug-fähig sind, stellen Sie sicher, daß zuvor alle Netzkabel abgezogen sind.*

Nehmen Sie keine Änderungen am Netzkabel vor, und verwenden Sie kein Kabel, das nicht genau dem geforderten Typ entspricht. Jedes Netzteil im System muß über ein eigenes Netzkabel angeschlossen werden.

Einige Netzteile von Intel Servern verwenden Nullleitersicherungen. Vorsicht ist geboten im Umgang mit Netzteilen, welche Nullleitersicherungen verwenden, um das Risiko eines elektrischen Schlages zu vermeiden

Das Netzteil in diesem Produkt enthält keine Teile, die vom Benutzer gewartet werden können. Öffnen Sie das Netzteil nicht. Im Netzteil bestehen gefährliche Spannungen, Ströme und Energiequellen. Schicken Sie das Gerät für Wartungsarbeiten an den Hersteller zurück.

Wenn Sie ein hot-plug-fähiges Netzteil austauschen, ziehen Sie dessen Netzkabel ab, bevor Sie es aus dem Server ausbauen.

Zur Vermeidung von Stromschlägen schalten Sie den Server aus, und trennen Sie vor dem Öffnen des Geräts das Netzkabel sowie alle an den Server angeschlossene Telekommunikationssysteme, Netzwerke und Modems.

Hinweis für Netzkabel

Wenn kein Netzkabel mit dem Produkt geliefert wurde, kaufen Sie ein Kabel, das für die

Vorsicht: *Prüfen Sie zur Vermeidung von Stromschlag- oder Feuergefahr die mit dem Produkt zu verwendenden Netzkabel wie folgt:*

- *Nehmen Sie keine Änderungen an einem Netzkabel vor, und benutzen sie es nicht, wenn es nicht genau in die geerdeten Netzsteckdosen paßt.*
- *Netzkabel müssen die folgenden Anforderungen erfüllen:*
- *Die Nennbelastbarkeit des Netzkabels muß mindestens so hoch sein wie die am Produkt angegebenen Nennstromaufnahme.*
- *Das Netzkabel muß einen zur Netzsteckdose passenden Schutzkontakt besitzen.*
- *Die Netzkabel sind die Hauptvorrichtung zum Trennen des Geräts vom Stromnetz. Die Steckdose muß in der Nähe der Anlage angebracht und gut erreichbar sein.*
- *Netzkabel müssen an eine ordnungsgemäß geerdete Steckdose angeschlossen sein.*

Warnhinweise für den Systemzugang

Vorsicht: *Um Verletzungen und Beschädigungen zu vermeiden, sollten Sie vor Arbeiten im Produktinneren folgende Sicherheitsanweisungen beachten:*

- *Schalten Sie alle am Produkt angeschlossenen Peripheriegeräte aus.*
- *Schalten Sie das System mit dem Netzschalter aus.*
- *Trennen Sie das Gerät von der Stromquelle, indem Sie alle Netzkabel vom System bzw. aus der Steckdose ziehen.*
- *Ziehen Sie alle Kabel und alle an das System angeschlossenen Telekommunikationsleitungen ab.*
- *Bewahren Sie alle Schrauben und anderen Befestigungselemente gut auf, nachdem Sie die Gehäuseabdeckung entfernt haben. Wenn Sie Ihre Arbeiten im Systeminneren beendet haben, befestigen Sie die Gehäuseabdeckung mit den Originalschrauben bzw. -befestigungselementen.*
- *Führen Sie keine Arbeiten im Netzteil aus.Das Netzteil enthält keine für den Benutzer wartungsbedürftigen Teile. Schicken Sie das Gerät für Wartungsarbeiten an den Hersteller zurück.*
- *Schalten Sie den Server aus, und ziehen Sie alle Netzkabel ab, bevor Sie Komponenten ein- oder ausbauen, die nicht hot-plug-fähig sind.*
- *Wenn Sie ein hot-plug-fähiges Netzteil austauschen, ziehen Sie dessen Netzkabel ab, bevor Sie es aus dem Server ausbauen.*

Vorsicht: *War Ihr Server in Betrieb, können die installierten Prozessoren und Kühlkörper heiß sein. Sofern Sie keine Hot-Plug-Komponenten ein- oder ausbauen, warten Sie mit dem Abnehmen der Abdeckungen, bis das System abgekühlt ist. Gehen Sie beim Aus- oder*

Einbauen von Hot-Plug-Komponenten sorgfältig vor, um nicht mit heißen Komponenten in Berührung zu kommen.

Vorsicht: *Berühren Sie nicht die rotierenden Lüfterflügel, um Verletzungen zu vermeiden. Falls Ihr System mit eine Lüfterabdeckung besitzt, darf es nicht ohne diese Abdeckung betrieben werden.*

Warnhinweise für Racks

Das Geräte-Rack muß auf einer geeigneten, festen Unterlage verankert werden, um ein Umkippen zu vermeiden, wenn ein Server oder andere Geräte herausgezogen werden. Bei der Installation des Racks müssen die Anweisungen des Rack-Herstellers beachtet werden.

Gehen Sie bei der Installation von Geräten im Rack immer von unten nach oben vor, und bauen Sie das schwerste Gerät an der untersten Position im Rack ein.

Ziehen Sie jeweils immer nur ein Gerät aus dem Rack heraus.

Sie müssen für die gesamte Rack-Einheit einen Netztrennschalter einrichten. Dieser Netztrennschalter muß leicht zugänglich sein und über eine Kennzeichnung verfügen, die besagt, daß er die Stromzufuhr zur gesamten Einheit steuert und nicht nur zu den Servern.

Zur Vermeidung von Stromschlaggefahr müssen das Rack selbst und alle darin eingebauten Geräte ordnungsgemäß geerdet sein.

Elektrostatische Entladungen (ESD)

Vorsicht: *Elektrostatische Entladungen können zur Beschädigung von Festplatten, Platinen und anderen Komponenten führen. Daher sollten Sie alle Arbeiten an einer ESD-Workstation ausführen. Steht ein solcher Arbeitsplatz nicht zur Verfügung, erzielen Sie einen gewissen Schutz vor elektrostatischen Entladungen durch Tragen einer Antistatik-Manschette, die Sie während der Arbeit zur Erdung an einem beliebigen unlackierten Metallteil des Computergehäuses befestigen.*

Gehen Sei bei der Handhabung von Platinen immer mit größter Vorsicht vor. Sie können äußerst empfindlich gegenüber elektrostatischer Entladung sein. Halten Sie Platinen nur an den Kanten fest. Legen Sie die Platinen nach dem Auspacken aus der Schutzhülle oder nach dem Ausbau aus dem Server mit der Bauelementseite nach oben auf eine geerdete, statisch entladene Unterlage.Verwenden Sie dazu, sofern verfügbar, eine leitfahige Schaumstoffunterlage, aber niche die Schutzhülle der Platine. Ziehen Sie die Platine nicht über eine Fläche.

Andere Gefahren

Batterieaustausch

Vorsicht: *Wird die Batterie unsachgemäß ausgetauscht, besteht Explosionsgefahr. Verwenden Sie als Ersatz nur die vom Gerätehersteller empfohlene Batterie.*

Beachten Sie bei der Entsorgung von Batterien die gültigen Bestimmungen.

Versuchen Sie nicht, eine Batterie aufzuladen.

Versuchen Sie nicht, eine Batterie zu öffnen oder sonstwie zu beschädigen.

Kühlung und Luftstrom

Vorsicht: *Verlegen Sie Kabel sorgfältig entsprechend der Anleitung, um Störungen des Luftstroms und Kühlungsprobleme zu vermeiden.*

Zur Gewährleistung des ordnungsgemäßen Kühlungs- und Luftstromverhaltens darf das System nur mit angebrachten Gehäuseabdeckungen betrieben werden. Die Inbetriebnahme des Systems ohne Abdeckung kann zur Beschädigung von Systemkomponenten führen. So bringen Sie die Abdeckung wieder an:

- Vergewissern Sie sich zunächst, daß Sie keine Werkzeuge oder Teile im Gehäuse vergessen haben.
- Prüfen Sie, ob Kabel, Erweiterungskarten sowie weitere Komponenten ordnungsgemäß angebracht sind.
- Befestigen Sie die Abdeckungen am Gehäuse des Produkts, wie in dessen Anleitung beschrieben.

Laser-Peripheriegeräte oder -Komponenten

Vorsicht: *Beachten Sie zur Vermeidung von Strahlung und Verletzungen die folgenden Hinweise:*

- *Öffnen Sie keinesfalls das Gehäuse von Laser-Peripheriegeräten oder Laser-Komponenten.*
- *Laser-Peripheriegeräte oder -Komponenten besitzen keine für den Benutzer wartungsbedürftigen Teile.*
- *Schicken Sie das Gerät für Wartungsarbeiten an den Hersteller zurück.*

Français

Consignes de sécurité sur le serveur

Ce document s'applique aux cartes serveur Intel®, au châssis de serveur Intel® (sur pieds et sur rack) et aux périphériques installés. Pour réduire les risques de dommages corporels, d'électrocution, d'incendie et de dommages matériels, lisez ce document et respectez tous les avertissements et précautions mentionnés dans ce guide avant d'installer ou de mettre à jour votre produit serveur Intel®.

En cas de conflit entre les informations fournies dans ce document et celles livrées avec le produit ou publiées sur le site Web pour un produit particulier, la documentation du produit prime.

Votre serveur doit être intégré et entretenu uniquement par des techniciens qualifiés.

Vous devez suivre les informations de ce guide et les instructions d'assemblage des manuels de serveur pour vérifier et maintenir la conformité avec les certifications et approbations de produit existantes. Utilisez uniquement les composants décrits et réglementés spécifiés dans ce guide. L'utilisation d'autres produits / composants annulera la liste UL et les autres approbations réglementaires du produit, et le produit peut ne pas être conforme aux autres lois et réglementations locales applicables au produit.

Sécurité: avertissements et mises en garde

Pour éviter de vous blesser ou d'endommager votre équipement, lisez et respectez toutes les informations et consignes de sécurité avant de commencer l'installation du produit. Les symboles de sécurité suivants peuvent être utilisés tout au long de cette documentation et peuvent figurer sur le produit ou sur son emballage.

ATTENTION	Indique la présence d'un risque pouvant entraîner des blessures physiques mineures ou endommager légèrement le matériel si la mise en garde n'est pas prise en compte.
AVERTISSEMENT	Indique la présence d'un risque pouvant entraîner des blessures corporelles graves si l'avertissement n'est pas pris en compte.
	Indique un risque potentiel si les informations signalées ne sont pas prises en compte.
	Indique des risques d'électrocution pouvant entraîner des blessures corporelles graves ou mortelles si les consignes de sécurité ne sont pas respectées.
	Signale des composants ou des surfaces soumis à des températures élevées.
	Indique de ne pas toucher aux pales de ventilateur, car cela peut entraîner des blessures.

	Indique de débrancher tous les cordons d'alimentation secteur pour déconnecter l'alimentation.
	Veuillez réutiliser la batterie

Domaines d'utilisation prévus

Ce produit a été testé comme équipement informatique (ITE) et peut être installé dans des bureaux, des écoles, des salles informatiques et des endroits commerciaux similaires. L'utilisation du présent produit dans des catégories et environnements de produits et domaines d'application (par exemple, le domaine médical, industriel, résidentiel, les systèmes d'alarme et les appareils de contrôle) autres qu'ITE doit faire l'objet d'évaluations supplémentaires.

Sélection d'un emplacement

Le système est conçu pour fonctionner dans un environnement standard de bureau. Choisissez un emplacement respectant les conditions suivantes :

- Propre, sec et exempt de particules en suspension (autres que la poussière normale d'une pièce).
- Bien ventilé et à l'écart des sources de chaleur telles que la lumière directe du soleil et les radiateurs.
- À l'écart des sources de vibration ou des chocs physiques.
- Isolé des champs électromagnétiques importants produits par des appareils électriques.
- Dans les régions sujettes aux orages magnétiques, nous vous recommandons de brancher votre système à un suppresseur de surtension et de déconnecter les lignes de télécommunication de votre modem pendant les orages.
- Équipé d'une prise murale reliée à la terre.
- Équipé d'un espace suffisant pour accéder aux cordons d'alimentation secteur, car ils servent de disjoncteur principal d'alimentation du produit.

Pratiques de manipulation de l'équipement

Réduisez le risque de dommages personnels ou matériels :

- Conformez-vous aux exigences de médecine du travail et de sécurité lorsque vous déplacez et soulevez le matériel.
- Utilisez l'assistance mécanique ou toute autre assistance appropriée lorsque vous déplacez et soulevez le matériel.
- Pour réduire le poids en vue de faciliter la manipulation, retirez tout composant amovible.

Alimentation et avertissements en matière d'électricité

Attention: *Le bouton d'alimentation, indiqué par le symbole de mise en veille, NE COUPE PAS complètement l'alimentation secteur du système car le courant de veille 5 V reste actif lorsque le système est sous tension. Pour couper l'alimentation du système, vous devez débrancher le cordon d'alimentation secteur de la prise murale. Votre système peut utiliser plusieurs cordons d'alimentation secteur. Assurez-vous que tous les cordons d'alimentation sont débranchés. Vous devez les débrancher avant d'ouvrir le châssis, d'ajouter ou de supprimer un composant non connectable à chaud.*

Les alimentations de certains serveurs Intel sont munies de doubles fusibles pôle / neutre: veuillez observer les précautions d'usage afin d'éviter tout risque d'eléctrocution.

N'essayez pas de modifier ou d'utiliser un cordon d'alimentation secteur s'il ne s'agit pas du type exact requis. Un cordon secteur est requis pour chaque alimentation système.

Le bloc d'alimentation de ce produit ne contient aucun composant réparable par l'utilisateur. N'ouvrez pas le bloc d'alimentation. L'intérieur de celui-ci est soumis à des niveaux dangereux de tension, de courant et d'énergie. Renvoyez-le au fabricant en cas de problème.

Lorsque vous remplacez un bloc d'alimentation à chaud, débranchez le cordon du bloc d'alimentation en cours de remplacement avant de le retirer du serveur.

Pour éviter tout risque d'électrocution, mettez le système hors tension et débranchez les cordons d'alimentation ainsi que les systèmes de télécommunication, réseaux et modems reliés au système avant d'ouvrir ce dernier.

Avertissements sur le cordon d'alimentation

Si aucun cordon d'alimentation secteur n'a été fourni avec votre produit, vous devez vous en procurer un qui soit approuvé pour une utilisation dans votre pays.

Attention: *Pour éviter tout risque d'électrocution ou d'incendie, vérifiez les cordons d'alimentation qui seront utilisés avec le produit comme suit:*

- *N'essayez pas d'utiliser ou de modifier les cordons d'alimentation en CA s'ils ne correspondent pas exactement au type requis pour les prises électriques reliées à la terre.*
- *Les cordons d'alimentation doivent répondre aux critères suivants :*
- *Le cordon d'alimentation doit supporter une intensité supérieure à celle indiquée sur le produit.*
- *Le cordon d'alimentation doit posséder une broche ou un contact de mise à la terre approprié à la prise électrique.*
- *Les cordons d'alimentation électrique représentent le principal dispositif de déconnexion raccordé à l'alimentation secteur. Les prises de courant doivent se trouver à proximité de l'équipement et être facilement accessibles pour une déconnexion.*
- *Les cordons d'alimentation doivent être branchés sur des prises électriques correctement reliées à la terre.*

Avertissements sur l'accès au système

Attention: *Pour éviter de vous blesser ou d'endommager votre équipement, les consignes de sécurité suivantes s'appliquent chaque fois que vous accédez à l'intérieur du produit:*

- *Mettez hors tension tous les périphériques connectés à ce produit.*
- *Éteignez le système en appuyant sur le bouton d'alimentation.*
- *Déconnectez l'alimentation secteur en débranchant tous les cordons d'alimentation secteur du système ou de la prise murale.*
- *Déconnectez l'ensemble des câbles et lignes de télécommunication qui sont connectés au système.*
- *Mettez toutes les vis ou autres attaches de côté lorsque vous retirez les panneaux d'accès. Une fois que vous avez terminé d'accéder à l'intérieur du produit, refixez le panneau d'accès avec les vis ou attaches d'origine.*
- *N'essayez pas d'accéder à l'intérieur du bloc d'alimentation. Il ne contient aucune pièce réparable. Renvoyez-le au fabricant en cas de problème.*
- *Mettez le serveur hors tension et débranchez tous les cordons d'alimentation avant d'ajouter ou de remplacer tout composant non connectable à chaud.*
- *Lorsque vous remplacez le bloc d'alimentation à chaud, débranchez le cordon du bloc d'alimentation en cours de remplacement avant de retirer le bloc du serveur.*

Attention: *Si le serveur a été utilisé, les processeurs et dissipateurs de chaleur installés peuvent être chauds. À moins que vous n'ajoutiez ou ne retiriez un composant connectable à chaud, laissez le système refroidir avant d'ouvrir les panneaux. Pour éviter tout risque d'entrer en contact avec un composant chaud lors d'une installation à chaud, prenez toutes les précautions nécessaires lorsque vous retirez ou installez des composants connectables à chaud.*

Attention: *Pour éviter de vous blesser, ne touchez pas les pales de ventilateur en mouvement. Si votre système est fourni avec une protection sur le ventilateur, ne mettez pas le système en route sans la protection en place.*

Avertissements sur le montage en rack

Le rack doit être fixé à un support inamovible pour éviter qu'il ne bascule lors de l'extension d'un serveur ou d'un élément de l'équipement. Le rack doit être installé conformément aux instructions du fabricant.

Installez les équipements dans le rack en partant du bas, en plaçant le plus lourd en bas du rack.

N'étendez qu'un seul élément de l'équipement à partir du rack à la fois.

Vous êtes responsable de l'installation d'un disjoncteur principal d'alimentation pour la totalité du rack. Ce disjoncteur principal doit être rapidement accessible et doit être étiqueté comme contrôlant toute l'unité, et pas uniquement le ou les serveurs.

Pour éviter tout risque d'électrocution, le rack et chaque élément de l'équipement installé dans le rack doivent être correctement reliés à la terre.

Décharges électrostatiques (ESD)

Attention: *Les décharges électrostatiques (ESD) peuvent endommager les lecteurs de disque dur, les cartes et d'autres pièces. Il est fortement conseillé d'effectuer l'ensemble des procédures décrites à un poste de travail protégé contre les ESD. Au cas où aucun poste de ce type ne serait disponible, protégez-vous contre les ESD en portant un bracelet antistatique relié à la masse du châssis (n'importe quelle surface métallique non peinte) de votre serveur lorsque que vous manipulez les pièces.*

Manipulez toujours les cartes avec précaution. Elles peuvent être extrêmement sensibles aux ESD. Ne tenez les cartes que par leurs bords. Après avoir retiré une carte de son emballage de protection ou du serveur, placez-la sur une surface reliée à la terre, exempte de charge statique, composants orientés vers le haut. Utilisez si possible un tapi de

mousse conducteru, mais pas l'emballage de la carte. Veillez à ce que la carte ne glisse sur aucune surface.

Autres risques

Remplacement de la pile

Attention: *Il existe un risque d'explosion si la pile n'est pas correctement remplacée. Lors du remplacement de la pile, utilisez uniquement celle recommandée par le fabricant du matériel.*

Mettez la pile au rebut en vous conformant aux réglementations locales.

N'essayez pas de recharger une pile.

N'essayez pas de démonter, de percer ou d'endommager la pile d'une quelconque façon.

Refroidissement et ventilation

Attention: *Routez les câbles avec précaution comme indiqué pour minimiser les blocages de circulation d'air et les problèmes de refroidissement.*

Afin de permettre une ventilation et un refroidissement corrects, ne mettez le système en marche que lorsque les panneaux du châssis sont en place. L'utilisation du système sans les panneaux peut endommager les composants système. Pour installer les panneaux :

- Vérifiez tout d'abord que vous n'avez pas oublié d'outils ou de composants détachés à l'intérieur du système.
- Vérifiez que les câbles, les cartes d'extension et les autres composants sont correctement installés.
- Fixez les panneaux au châssis en suivant les instructions du produit.

Périphériques laser

Attention: *Pour éviter tout risque d'exposition aux rayonnements et/ou de dommage personnel:*

- *N'ouvrez pas l'enceinte d'un périphérique laser.*
- *Les périphériques laser ne sont pas réparables par l'utilisateur.*
- *Retournez-les au fabricant en cas de problème.*

Español

Información de seguridad del servidor

Este documento se aplica a las tarjetas de servidor de Intel®, las carcasas de servidor de Intel® (montaje en bastidor y en pedestal) y los dispositivos periféricos. Para reducir el riesgo de daños corporales, descargas eléctricas, fuego y en el equipo, lea este documento y preste atención a todos las advertencias y precauciones de esta guía antes de instalar o mantener el producto de servidor de Intel®.

En el caso de que haya diferencias entre la información para un producto en particular contenida en este documento y la información proporcionada con dicho producto o en el sitio Web, la documentación del producto es la que prevalece.

Sólo personal técnico cualificado debe montar y prestar los servicios para el servidor.

Debe ceñirse a las directrices de esta guía y a las instrucciones de montaje de los manuales del servidor para asegurar y mantener el cumplimiento con las certificaciones y homologaciones existentes de los productos. Utilice sólo los componentes descritos y homologados que se especifican en esta guía. El uso de otros productos o componentes anulará la homologación UL y otras certificaciones oficiales del producto, pudiendo dejar de ser compatible con las normativas locales de los países en los que se comercializa.

Advertencias y precauciones sobre seguridad

Para reducir la posibilidad de que se produzcan lesiones personales o daños en la propiedad, antes de empezar a instalar el producto, lea, observe y cumpla toda la información e instrucciones de seguridad siguientes. Puede que se utilicen los siguientes símbolos de seguridad en la documentación y es posible que aparezcan en el producto o en su embalaje.

PRECAUCIÓN	Indica la existencia de un riesgo que podría causar lesiones personales o daños en la propiedad leves si no se tiene en cuenta la PRECAUCIÓN.
ADVERTENCIA	Indica la existencia de un riesgo que podría causar lesiones personales graves si no se tiene en cuenta la ADVERTENCIA.
	Indica un riesgo potencial si no se tiene en cuenta la información indicada.
	Indica riesgo de descargas eléctricas que podrían causar lesiones graves o la muerte si no se siguen las instrucciones de seguridad.
	Indica componentes o superficies calientes.
	Indica que no se deben tocar las aspas de los ventiladores, ya que de lo contrario se podrían producir lesiones.

	Indica que es necesario desenchufar los cables de alimentación de CA para desconectar la alimentación de CA
	Recicle por favor la batería

Aplicaciones y usos previstos

Este producto ha sido evaluado como equipo de tecnología informática (ITE) que puede instalarse en oficinas, escuelas, salas de equipos informáticos o lugares de ámbito comercial similares. Es posible que sea necesario llevar a cabo una evaluación adicional para comprobar si este producto es apropiado para otras categorías de productos y entornos además de las aplicaciones informáticas (por ejemplo, soluciones médicas, industriales, residenciales, sistemas de alarma y equipos de pruebas).

Selección de la ubicación

El sistema se ha diseñado para funcionar en un entorno normal de oficinas. Seleccione una ubicación que esté:

- Limpia, seca y libre de macropartículas en suspensión en el aire (que no sean el polvo habitual de la habitación).
- Bien ventilada y alejada de fuentes de calor, incluida la luz solar directa y los radiadores.
- Alejada de fuentes de vibración o de golpes físicos.
- Aislada de campos electromagnéticos producidos por dispositivos eléctricos.
- En zonas propensas a tormentas eléctricas, se recomienda que conecte el servidor a un supresor de sobretensiones y desconecte las líneas de telecomunicaciones al módem durante una tormenta eléctrica.
- Provista de una toma de corriente alterna correctamente conectada a tierra.
- Provista de espacio suficiente para acceder a los cables de la fuente de alimentación ya que constituyen la desconexión principal de la alimentación.

Manipulación del equipo

Reduzca el riesgo de daños personales o en el equipo:

- Respete los requisitos de sanidad y seguridad laborales de su país cuando traslade y levante el equipo.
- Utilice medios mecánicos u otros que sean adecuados al trasladar o levantar el equipo.
- Para que el peso sea menor para manipularlo con más facilidad, extraiga los componentes que sean de fácil extracción.

Advertencias de alimentación y eléctricas

Precaución: *El botón de encendido, indicado con la marca del modo de reposo o stand-by, NO DESCONECTA completamente la alimentación de CA del sistema, ya que el modo de reposo de 5 V sigue activo mientras el sistema está enchufado. Para desconectar el sistema debe desenchufar el cable de alimentación de CA de la toma de la pared. Puede usar más de un cable de alimentación de CA con el sistema. Asegúrese de que todos los cables de alimentación de CA están desenchufados. Asegúrese de que los cables de alimentación de CA estén desenchufado antes de abrir la carcasa, agregar o extraer cualquier componente que no es de conexión en funcionamiento.*

Algunas fuentes de alimentación de electricidad de los servidores de Intel utilizan el polo neutral del fuselaje. Para evitar riesgos de choques electricos use precauciónes al trabajar con las fuentes de alimentación que utilizan el polo neutral de fuselaje.

No intente modificar ni utilizar un cable de alimentación de CA si no es del tipo exacto requerido. Se necesita un cable de CA para cada fuente de alimentación del sistema.

La fuente de alimentación de este producto no contiene piezas que puedan ser reparadas por el usuario. No abra la fuente de alimentación. Dentro de la fuente de alimentación puede haber niveles de tensión, corriente y energía peligrosos. Devuélvala al fabricante para repararla.

Al reemplazar una fuente de alimentación de conexión en funcionamiento, desenchufe el cable de alimentación de la fuente de alimentación que va a reemplazar antes de extraerla del servidor.

Para evitar el riesgo de descargas eléctricas, antes de abrir el servidor, apáguelo, desconecte el cable de alimentación, los sistemas de telecomunicaciones, las redes y los módems conectados al mismo.

Advertencias sobre el cable de alimentación

Si no se ha proporcionado con el producto ningún cable de alimentación de CA, adquiera alguno cuyo uso esté aprobado en su país.

Precaución: *Para evitar descargas eléctricas o fuego, revise los cables de alimentación que usará con el producto tal y como se describe a continuación:*

- *No intente modificar ni utilizar los cables de alimentación de CA si no son exactamente del modelo especificado para ajustarse a las tomas de corriente conectadas a tierra*
- *Los cables de alimentación deben reunir los siguientes requisitos:*
- *El cable de alimentación debe disponer de una capacidad nominal de corriente eléctrica mayor que la capacidad especificada en el producto.*
- *El cable de alimentación debe disponer de una patilla o contacto de conexión a tierra que sea apto para la toma de corriente.*
- *Los cables de la fuente de alimentación son los dispositivos de desconexión principales a la corriente alterna. El enchufe o enchufes de zócalo deben encontrarse cerca del equipo y el acceso a ellos debe poderse efectuar de forma inmediata con el fin de desconectarlos.*

- *Los cables de la fuente de alimentación deben estar conectados a los enchufes con una toma de tierra adecuada.*

Advertencias el acceso al sistema

Precaución: *Para evitar lesiones personales o daños en la propiedad, se aplican las siguientes instrucciones de seguridad siempre que se acceda al interior del producto:*

- *Apague todos los dispositivos periféricos conectados a este producto.*
- *Pulse el botón de alimentación para apagar el sistema.*
- *Desconecte la alimentación de CA desenchufando los cables de alimentación de CA del sistema o de la toma de corriente alterna.*
- *Desconecte todos los cables y líneas de telecomunicación que estén conectados al sistema.*
- *Guarde todos los tornillos o elementos de fijación cuando retire las cubiertas de acceso. Cuando termine de operar en el interior del producto, vuelva a colocar los tornillos o los elementos de fijación originales de la cubierta de acceso.*
- *No acceda al interior de la fuente de alimentación. No hay elementos en la fuente de alimentación que usted pueda reparar y utilizar. Devuélvala al fabricante para repararla.*
- *Apague el servidor y desconecte todos los cables de alimentación antes de agregar o reemplazar cualquier componente que no es de conexión en funcionamiento.*
- *Al reemplazar una fuente de alimentación de conexión en funcionamiento, desenchufe el cable de alimentación de la fuente de alimentación que va a reemplazar antes de extraerla del servidor.*

Precaución: *Si el servidor se ha estado ejecutando, los procesadores y disipadores de calor estarán recalentados. A no ser que esté instalando o extrayendo un componente de conexión en funcionamiento, deje que el sistema se enfríe antes de abrir las cubiertas. Para que no llegue a tocar los componentes que estén calientes cuando esté realizando una instalación de conexión en funcionamiento, tenga cuidado al extraer o instalar los componentes de conexión en funcionamiento.*

Precaución: *Para evitar posibles daños, no toque las aspas en movimiento de los ventiladores. Si el sistema se le ha suministrado con una protección para el ventilador, asegúrese de que cuando esté funcionando el sistema la protección esté en su sitio.*

Advertencias sobre el montaje en bastidor

El bastidor del equipo se debe sujetar con un soporte fijo para evitar que se caiga cuando se extraiga un servidor o una pieza del mismo. El bastidor del equipo debe instalarse siguiendo las instrucciones del fabricante del bastidor.

Instale el equipo en el bastidor comenzando desde la parte de abajo, con el equipo más pesado en la parte inferior del bastidor.

Extraiga las piezas del equipo del bastidor de una a una.

El usuario es el responsable de la instalación de un dispositivo de desconexión de la alimentación principal para toda la unidad del bastidor. El acceso a este dispositivo de desconexión deberá ser de fácil acceso y deberán incluirse indicaciones que lo identifiquen como el control de alimentación eléctrica de toda la unidad, no sólo de los servidores.

Para evitar el riesgo de descargas eléctricas, deberá instalar una conexión a tierra apropiada para el bastidor y para cada pieza del equipo instalada en el mismo.

Descarga electrostática (ESD)

Precaución: *Las descargas electrostáticas pueden dañar las unidades de disco, las tarjetas y otros componentes. Recomendamos que realice todos los procedimientos en una estación de trabajo protegida contra descargas electrostáticas. En caso de que no haya una disponible, protéjase de alguna forma contras las descargas llevando un brazalete antiestático conectado a la toma de tierra de la carcasa (cualquier superficie de metal que no esté pintada) del servidor cuando manipule las piezas.*

Manipule siempre las tarjetas con el máximo cuidado. Pueden ser sumamente sensibles a las descargas electrostáticas. Sujételas sólo por los bordes. Una vez extraída la tarjeta de su envoltorio de protección o del servidor, colóquela con el lado de los componentes hacia arriba sobre una superficie con toma de tiearra y sin carga estática. Utilice una

almohadilla de espuma conductora si dispone de ella, pero nunca el envoltorio de la tarjeta. No deslice la tarjeta sobre ninguna superficie.

Sustitución de la batería

Precaución: *Existe el peligro de explosión si la batería no se reemplaza correctamente. Al reemplazar la batería, utilice sólo la batería recomendada por el fabricante del equipo.*

Deseche las baterías respetando la normativa local.

No intente recargar la batería.

No intente desmontar, pinchar o causar cualquier otro desperfecto a una batería.

Enfriamiento y circulación de aire

Precaución: *El tendido de los cables debe realizarse cuidadosamente tal y como se le indica para reducir al mínimo los problemas de obstrucción de la ventilación y de refrigeración.*

Para conseguir una refrigeración y corriente de aire adecuadas, compruebe que cuando sistema esté funcionando, las cubiertas de la carcasa están instaladas. Si utiliza el sistema sin las cubiertas, podría dañar sus componentes. Para instalar las cubiertas:

- *Compruebe primero que no ha dejado herramientas o piezas sueltas dentro del sistema.*
- *Compruebe que los cables, tarjetas adicionales y otros componentes están instalados correctamente.*
- *Sujete las cubiertas a la carcasa siguiendo las instrucciones del producto.*

Periféricos o dispositivos láser

Precaución: *Para evitar el riesgo de la exposición a radiaciones o de daños personales:*

- *No abra la caja de ningún periférico o dispositivo láser*
- *Los periféricos o dispositivos láser no pueden ser reparados por el usuario*
- *Haga que el fabricante los repare.*

简体中文

服务器安全信息

本文档适用于 Intel® 服务器主板、Intel®
服务器机箱（基座和机架固定件）和已安装的外设。为减少人身伤害、电击、火
以及设备毁坏的危险，请在安装或维护 Intel®
服务器产品之前阅读本文档并遵循本指南中的所有警告和预防措施。

如果本文档中的信息与特定产品的随附信息或 Web
站点信息之间存在不一致，请以产品文档为准。

服务器须由合格的技术人员进行集成和维护。

必须遵守本指南的规定和服务器手册的装配指导，以确保符合现有的产品认证和
批。仅使用本指南中描述和规定的指定组件。使用其他产品 / 组件将使产品的
认证和其他管理审批无效，并可能导致产品不符合销售地的产品法规。

安全警告与注意事项

为避免人身伤害与财产损失，安装本产品之前，请阅读以下所有安全指导和信息
下面所列的安全符号可能在整个文档中使用并可能标注于产品和 /
或产品包装之上。

注意	表示如果无视此“？？？项”？？？？？？？？ 轻微人身伤害或财产损失的危
警告	表示如果无视此“？？ ”？？？？？？？？ 严重人身伤害的危险。
	表示如果无视所示信息，即存在潜在的危险。
	表示如果不遵守安全指导，存在可导致严重伤害或死亡的电击危险。
	表示灼热组件或表面。
	表示请勿触摸风机叶片，否则可能致伤。
	表示拔下所有交流电线，断开交流电源

预期应用使用

根据评估，本产品为信息技术设备
(ITE)，可安装在办公室、学校、计算机房和类似的商业场所。本产品对于非 ITE 应用的其他产品种类和环境（如医疗、工业、住宅、报警系统和测试设备）的适用性尚有待进一步的评估。

场地选择

本系统专为在典型办公环境运行而设计。请选择符合以下条件的地点：

- 清洁、干燥，无气载微粒（而非一般的室内尘埃）。
- 通风良好，远离热源（包括直接日晒和散热器）。
- 远离振动源或物理震动。
- 与电气设备产生的强大电磁场隔离。
- 在易受闪电袭击的地区，我们建议将系统插入电涌抑制器并在闪电期间断开通信线路与调制解调器之间的连接。
- 提供正确接地的墙壁插座。
- 提供足够的空间，以便拿取电源供应线，因为这是本产品的主要电源断开器。

设备操作规范

减少人身伤害或设备受损的危险：

- 移举设备时遵守当地的职业健康与安全要求。
- 借助机械手段或其他合适的手段移举设备。
- 拆除一切易分离组件，以降低重量并方便操作。

电源与电气警告

⚠注意事项

电源按钮（如待机电源标记所示）并不能完全关闭系统的交流电源，只要系统已接通电源，就存在 5V
待机电源。要从系统切断电源，须从墙壁电源插座中拔下交流电线。您的系统可能不止使用一根交流电线。请确保所有的交流电线都已拔下。打开机箱或增加或去除任何热插拔组件之前，确保交流电线已拔下。

若非所需的确切类型，请勿尝试修改或使用交流电线。系统的每个电源供应设备都需要一根单独的交流电线。

本产品的电源供应设备包含非用户维修部件。请勿打开电源供应设备。电源供应设备包含非常危险的电压级、电流级和能量级。请与生产商联系维修事宜。

替换热插拔电源供应设备时，请先拔下需替换的电源供应设备上的电源线，再将其从服务器上移除。

为避免电击，请在打开服务器之前，关闭服务器并断开服务器上连接的电源线、电信系统、网络和调制解调器。

电源线警告

如果产品未提供交流电线，请购买一根您所在国家批准使用的交流电线。

⚠注意事项

为避免电击或火灾危险，请按如下所述对产品所用的电源线进行检查：

- 若非所需的符合接地插座的确切类型，请勿尝试修改或使用交流电线
- 电源线须符合以下标准：
  - 电源线的电气额定值须大于产品上标注的电流额定值。
  - 电源线须拥有适合插座的安全接地插头或触点。
- 电源线为交流电源的主要断开设备。插座须靠近设备并可随时断开。
- 电源线须插入所提供的拥有合适接地的插座。

系统使用警告

⚠注意事项

为避免人身伤害或财产损失，无论何时检查产品内部，以下安全指导都适用：

- 关闭所有与本产品相连的外设。
- 按下电源按钮至关闭状态，关闭系统。
- 从系统或墙壁插座上拔下所有交流电线，断开交流电源。
- 断开与系统相连的所有线缆和通信线路。
- 卸除舱口盖时，保留所有螺钉及其他紧固件。完成产品内部检查之后，请用螺钉或紧固件重新固定舱口盖。
- 请勿打开电源供应设备。电源供应设备内没有可维修部件。请与生产商联系维修事宜.
- 增加或替换任何非热插拔组件之前，请关闭服务器电源并断开所有电源线。
- 替换热插拔电源供应设备时，请先拔下需替换的电源供应设备上的电源线，然后再从服务器上移除电源供应设备。

⚠⚠ 注意事项

如果服务器一直在运行，任何已安装的处理器和吸热设备都可能很热。除非要增加或移除热插拔组件，否则请待系统冷却后再开盖。为避免在热插拔组件安装过程中接触灼热组件，移除或安装热插拔组件时务须小心。

⚠ **注意事项**

为避免受伤，请勿触摸运转的风机叶片。如果系统的风机上配有防护装置，请勿卸下风机防护装置运行系统。

机架固定件警告

设备的机架须固定在稳固的支座上，以防从中安装服务器或设备时倒塌。须按照机架生产商提供的安装说明进行安装。

从下往上将设备安装在机架上，最重的设备安装在机架的最底层。

一次只从机架上安装一件设备。

您须负责安装整个机架装置的主要电源断开设备。此主要断开设备须随时可用，且须标明为控制整个装置（而不仅限于服务器）的电源。

为避免潜在的电击危险，须对机架及其上所安装的每一件设备实行正确的安全接地。

静电放电（ESD）

⚠ **注意事项**

ESD 会损坏磁盘驱动器、主板及其他部件。我们建议您执行 ESD 工作站的所有步骤。如果没有 ESD 工作站，则采取一些静电放电保护措施，操作部件时，戴上与服务器上的机箱接地或任何未喷漆金属表面连接的防静电腕带。

操作主板时始终保持小心。它们可能对 ESD 非常敏感。拿持主板时只接触边缘。从保护包装中或从服务器上取出主板后，请将主板组件侧面朝上放置在无静电的接地表面上。请使用导电泡沫垫（若有），不要使用主板包装。请勿将主板在任何表面上滑动。

其他危险

替换电池

⚠ **注意事项**

不正确替换电池可能导致爆炸危险。替换电池时，请只使用设备生产商推荐使用的电池。

请按当地法规处置电池。

请勿对电池充电。

请勿拆卸、刺穿或以其他方式损坏电池。

冷却和气流

⚠ **注意事项**

按照说明小心布置线缆，尽量减少气流阻塞和冷却问题。

为保证适当的冷却和气流，运行系统时请确保机箱盖已安装。未安装机箱盖即运行系统可能导致系统部件受损。安装机箱盖的步骤如下：

- 首先检查并确保系统内没有遗留的未固定工具或部件。
- 检查线缆、内插板和其他组件已正确安装。
- 按产品说明安装机箱盖。

激光外设或激光设备

⚠ **注意事项**

为避免幅射暴露和 / 或人身伤害：

- 请勿打开任何激光外设或激光设备的外壳
- 激光外设或激光设备为非用户维修设备

请与生产商联系维修事宜

Appendix D: Regulatory and Compliance Information

Product Regulatory Compliance

Product Safety Compliance

The Intel® Server Chassis [name] complies with the following safety requirements:

- UL60950 - CSA 60950 (USA / Canada)
- EN60950 (Europe)
- IEC60950 (International)
- CB Certificate & Report, IEC60950 (report to include all country national deviations)
- GS License (Germany)
- GOST R 50377-92 - License (Russia)
- Belarus License (Belarus)
- Ukraine License (Ukraine)
- CE - Low Voltage Directive 73/23/EEE (Europe)
- IRAM Certification (Argentina)
- GB4943- CNCA Certification (China)

Product EMC Compliance - Class A Compliance

Note: *Legally the product is required to comply with Class A emission requirements as it is intended for a commercial type market place. Intel targets 10db margin to Class A Limits*

- FCC / ICES-003 - Emissions (USA / Canada) Verification
- CISPR 22 - Emissions (International)
- EN55022 - Emissions (Europe)
- EN55024 - Immunity (Europe)
- EN61000-3-2 - Harmonics (Europe)
- EN61000-3-3 - Voltage Flicker (Europe)
- CE - EMC Directive 89/336/EEC (Europe)
- VCCI Emissions (Japan)

- AS/NZS 3548 Emissions (Australia / New Zealand)
- BSMI CNS13438 Emissions (Taiwan)
- GOST R 29216-91 Emissions (Russia)
- GOST R 50628-95 Immunity (Russia)
- Belarus License (Belarus)
- Ukraine License (Ukraine)
- RRL MIC Notice No. 1997-41 (EMC) & 1997-42 (EMI) (Korea)
- GB 9254 - CNCA Certification (China)
- GB 17625 - (Harmonics) CNCA Certification (China)

Certifications / Registrations / Declarations

- UL Certification (US / Canada)
- CE Declaration of Conformity (CENELEC Europe)
- FCC/ICES-003 Class A Attestation (USA / Canada)
- VCCI Certification (Japan)
- C-Tick Declaration of Conformity (Australia)
- MED Declaration of Conformity (New Zealand)
- BSMI Certification (Taiwan)
- GOST R Certification / License (Russia)
- Belarus Certification / License (Belarus)
- RRL Certification (Korea)
- IRAM Certification (Argentina)
- CNCA Certification (China)
- Ecology Declaration (International)

Product Regulatory Compliance Markings

This product is marked with the following Product Certification Markings:

Table 12. Product Regulatory Compliance Markings

Regulatory Compliance	Region	Marking
cULus Listing Marks	USA / Canada	

Table 12. Product Regulatory Compliance Markings

Regulatory Compliance	Region	Marking
GS Mark	Germany	
CE Mark	Europe	
FCC Marking (Class A)	USA	This device complies with Part 15 of the FCC Rules. Operation of this device is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation. Manufactured by Intel Corporation
EMC Marking (Class A)	Canada	CANADA ICES-003 CLASS A CANADA NMB-003 CLASSE A
C-Tick Mark	Australia / New Zealand	
VCCI Marking (Class A)	Japan	この装置は、クラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。VCCI-A
BSMI Certification Number & Class A Warning	Taiwan	 警告使用者： 這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策
GOST R Marking	Russia	
RRL MIC Mark	Korea	 인증번호: CPU See the regulatory information document for additional information.
China Compulsory Certification Mark	China	
WEEE Mark		

Table 12. Product Regulatory Compliance Markings

Regulatory Compliance	Region	Marking
Recycling Package Mark	China	
Recycling Package Mark	Other than China	
RoHS	China	

Electromagnetic Compatibility Notices

FCC Verification Statement (USA)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions related to the EMC performance of this product, contact:

```
Intel Corporation
5200 N.E. Elam Young Parkway
Hillsboro, OR 97124-6497
1-800-628-8686
```

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.

- Connect the equipment to an outlet on a circuit other than the one to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment. The customer is responsible for ensuring compliance of the modified product.

Only peripherals (computer input/output devices, terminals, printers, etc.) that comply with FCC Class A or B limits may be attached to this computer product. Operation with noncompliant peripherals is likely to result in interference to radio and TV reception.

All cables used to connect to peripherals must be shielded and grounded. Operation with cables, connected to peripherals, that are not shielded and grounded may result in interference to radio and TV reception.

Industry Canada (ICES-003)

Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: “Apparelis Numériques”, NMB-003 édictee par le Ministre Canadian des Communications.

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled: “Digital Apparatus,” ICES-003 of the Canadian Department of Communications.

Europe (CE Declaration of Conformity)

This product has been tested in accordance too, and complies with the Low Voltage Directive (73/23/EEC) and EMC Directive (89/336/EEC). The product has been marked with the CE Mark to illustrate its compliance.

VCCI (Japan)

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

English translation of the notice above:

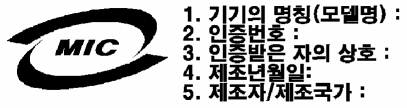
This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI) from Information Technology Equipment. If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

BSMI (Taiwan)

The BSMI Certification Marking and EMC warning is located on the outside rear area of the product.

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策

RRL (Korea)



English translation of the notice above:

1. Type of Equipment (Model Name): On License and Product
2. Certification No.: On RRL certificate. Obtain certificate from local Intel representative
3. Name of Certification Recipient: Intel Corporation
4. Date of Manufacturer: Refer to date code on product
5. Manufacturer/Nation: Intel Corporation/Refer to country of origin marked on product

CNCA (CCC China)

The CCC Certification Marking and EMC warning is located on the outside rear area of the product.

声明

此为A级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取可行的措施。

Regulated Specified Components

To maintain the UL listing and compliance to other regulatory certifications and/or declarations, the following regulated components must be used and conditions adhered to. Interchanging or use of other component will void the UL listing and other product certifications and approvals.

Updated product information for configurations can be found on the Intel Server Builder Web site at the following URL:

http://channel.intel.com/go/serverbuilder

If you do not have access to Intel's Web address, please contact your local Intel representative.

- **Server Chassis:** (base chassis is provided with power supply and fans) UL listed.
- **Server board:** you must use an Intel server board-UL recognized.
- **Add-in cards:** must have a printed wiring board flammability rating of minimum UL94V-1. Add-in cards containing external power connectors and/or lithium batteries must be UL recognized or UL listed. Any add-in card containing modem telecommunication circuitry must be UL listed. In addition, the modem must have the appropriate telecommunications, safety, and EMC approvals for the region in which it is sold.
- **Peripheral Storage Devices:** must be UL recognized or UL listed accessory and TUV or VDE licensed. Maximum power rating of any one device is 19 watts. Total server configuration is not to exceed the maximum loading conditions of the power supply.

Restriction of Hazardous Substances (RoHS) Compliance

Intel has a system in place to restrict the use of banned substances in accordance with the European Directive 2002/95/EC. Compliance is based on declaration that materials banned in the RoHS Directive are either (1) below all applicable threshold limits or (2) an approved / pending RoHS exemption applies.

RoHS implementation details are not fully defined and may change.

Threshold limits and banned substances are noted below:

- Quantity limit of 0.1% by mass (1000 PPM) for:
  - Lead
  - Mercury
  - Hexavalent Chromium
  - Polybrominated Biphenyls Diphenyl Ethers (PBDE)

- Quantity limit of 0.01% by mass (100 PPM) for:
  - Cadmium

End of Life / Product Recycling

Product recycling and end-of-life take-back systems and requirements vary by country. Contact the retailer or distributor of this product for information about product recycling and / or take-back.

Appendix E: Equipment Log

Item	Manufacturer Name and Model Number	Serial Number	Date Installed
System			
Main Board			
Memory Board (A)			
Memory Board (B)			
Memory Board (C)			
Memory Board (D)			
SAS Riser Board			
I/O Riser Board			
Power Distribution Board			
Intel® Remote Management Module 2			
Front Panel I/O Board			
Control Module (with or without LCD)			
SAS Backplane Board			
Processor Speed and Cache			
Monitor			
Keyboard			
Mouse			
CD-ROM/DVD-ROM Drive			
Tape drive			
Hard Drive (0)			
Hard Drive (1)			
Hard Drive (2)			
Hard Drive (3)			

Item	Manufacturer Name and Model Number	Serial Number	Date Installed
Hard Drive (4)			
Hard Drive (5)			
Hard Drive (6)			
Hard Drive (7)			
Power Supply (P1)			
Power Supply (P2)			
Hot-plug PCI Express* Slot (1)			
Hot-plug PCI Express Slot (2)			
PCI Express Slot (3)			
PCI Express Slot (4)			
PCI Express Slot (5)			
PCI Express Slot (6)			
PCI Express Slot (7)			

Appendix F: Warranty

Limited Warranty for Intel® Chassis Subassembly Products

Intel warrants that the Products (defined herein as the Intel® chassis subassembly and all of its various components and software delivered with or as part of the Products) to be delivered hereunder, if properly used and installed, will be free from defects in material and workmanship and will substantially conform to Intel's publicly available specifications for a period of three (3) years after the date the Product was purchased from an Intel authorized distributor. Software of any kind delivered with or as part of products is expressly provided “as is” unless specifically provided for otherwise in any software license accompanying the software.

If any Product furnished by Intel which is the subject of this Limited Warranty fails during the warranty period for reasons covered by this Limited Warranty, Intel, at its option, will:

- REPAIR the Product by means of hardware and / or software; OR
- REPLACE the Product with another Product; OR
- REFUND the then-current value of the Product if Intel is unable to repair or replace the Product.

If such Product is defective, transportation charges for the return of Product to buyer within the USA will be paid by Intel. For all other locations, the warranty excludes all costs of shipping, customs clearance, and other related charges. Intel will have a reasonable time to make repairs or to replace Product or to refund the then-current value of the Product.

In no event will Intel be liable for any other costs associated with the replacement or repair of Product, including labor, installation or other costs incurred by buyer and in particular, any costs relating to the removal or replacement of any product soldered or otherwise permanently affixed to any printed circuit board.

This Limited Warranty, and any implied warranties that may exist under state law, apply only to the original purchaser of the Product.

Extent of Limited Warranty

Intel does not warrant that Products to be delivered hereunder, whether delivered stand-alone or integrated with other Products, including without limitation semiconductor components, will be free from design defects or errors known as “errata.” Current characterized errata are available upon request.

This Limited Warranty does not cover damages due to external causes, including accident, problems with electrical power, usage not in accordance with product instructions, misuse, neglect, alteration, repair, improper installation, or improper testing.

Warranty Limitations and Exclusions

These warranties replace all other warranties, expressed or implied including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Intel makes no expressed warranties beyond those stated here. Intel disclaims all other warranties, expressed or implied including, without limitation, implied warranties of merchantability and fitness for a particular purpose. Some jurisdictions do not allow the exclusion of implied warranties, so this limitation may not apply.

All expressed and implied warranties are limited in duration to the limited warranty period. No warranties apply after that period. Some jurisdictions do not allow limitations on how long an implied warranty lasts, so this limitation may not apply to you.

Limitations of Liability

Intel's responsibility under this, or any other warranty, implied or expressed, is limited to repair, replacement, or refund, as set forth above. These remedies are the sole and exclusive remedies for any breach of warranty. Intel is not responsible for direct, special, incidental, or consequential damages resulting from any breach of warranty under another legal theory including, but not limited to, lost profits, downtime, goodwill, damage to or replacement of equipment and property, and any costs of recovering, reprogramming, or reproducing any program or data stored in or used with a system containing this product. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

This limited warranty gives you specific legal rights, and you may also have other rights that vary from jurisdiction to jurisdiction.

Any and all disputes arising under or related to this Limited Warranty shall be adjudicated in the following forums and governed by the following laws: for the United States of America, Canada, North America, and South America, the forum shall be Santa Clara, California, USA, and the applicable law shall be that of the State of California, USA; for the Asia Pacific region, the forum shall be Singapore and the applicable law shall be that of Singapore; for Europe and the rest of the world, the forum shall be London and the applicable law shall be that of the United Kingdom.

In the event of any conflict between the English language version and any other translated version(s) of this Limited Warranty, the English language version shall control.

How to Obtain Warranty Service

To obtain warranty service for this Product, you may contact Intel or your authorized distributor.

- North America and Latin America To obtain warranty repair for the product, please go to the following Web site to obtain instructions: http://support.intel.com/support/motherboards/draform.htm
- In Europe and in Asia Contact your original authorized distributor for warranty service.

Any replacement Product is warranted under this written warranty and is subject to the same limitations and exclusions for the remainder of the original warranty period.

Telephone Support

If you cannot find the information you need on Intel's World Wide Web site (http://www.intel.com/), call your local distributor or an Intel Customer Support representative. See “Getting Help” for telephone numbers.

Returning a Defective Product

Before returning any product, call your authorized dealer / distribution authority.

Appendix G: Getting Help

World Wide Web

http://support.intel.com/support/motherboards/server/S7000FC4UR.

Telephone

All calls are billed per incident, levied in local currency at the applicable credit card exchange rate plus applicable taxes. (Intel reserves the right to change the pricing for telephone support at any time without notice).

Before calling, fill out an Issue Report form. For the fastest service, please submit your form via the Internet.

For an updated support contact list, see http://www.intel.com/support/9089.htm/

U.S. and Canada

See http://support.intel.com/support/motherboards/server/S7000FC4UR.

Europe

Belgium 02 714 3182

Denmark ... 38 487077

Finland 9 693 79297

France..... 01 41 918529

Germany ... 069 9509 6099

Holland..... 020 487 4562

Italy..... 02 696 33276

Norway 23 1620 50

Spain..... 91 377 8166

Sweden..... 08 445 1251

UK..... 870 6072439

In Asia-Pacific Region

Australia.... 1800 649931

Cambodia.. 63 2 636 9797 (via Philippines)

China ..... 800 820 1100 (toll-free)

..... 8 621 33104691 (not toll-free)

Hong Kong 852 2 844 4456

India..... 0006517 2 68303634 (manual toll-free. You need an IDD-equipped telephone)

Indonesia... 803 65 7249

Korea 822 767 2595

Malaysia 1 800 80 1390

Myanmar... 63 2 636 9796 (via Philippines)

New Zealand 0800 444 365

Pakistan..... 632 63684 15 (IDD via Philippines)

Philippines 1 800 1 651 0117

Singapore .. 65 6213-1311

Taiwan 2 2545-1640

Thailand.... 1 800 631 0003

Vietnam..... 632 6368416 (IDD via Philippines)

Japan

Domestic.... 0120 868686

Outside country 81 298 47 0800

Latin America

Argentina .. Contact AT&T USA at 0-800 222 1288. Once connected, dial 800 843 4481

Brazil 001-916 377 0180

Chile

Easter Island. ..... Contact AT&T USA at 800 800 311. Once connected, dial 800 843 4481

Mainland and Juan .. Contact AT&T USA at 800 225 288. Once connected, dial 800 843 4481

Colombia ... Contact AT&T USA at 01 800 911 0010. Once connected, dial 800 843 4481

Costa Rica . Contact AT&T USA at 0 800 0 114 114. Once connected, dial 800 843 4481

Ecuador

(Andimate) .... Contact AT&T USA at 1 999 119. Once connected, dial 800 843 4481

(Pacifictel) ..... Contact AT&T USA at 1 800 225 528. Once connected, dial 800 843 4481

Guatemala . Contact AT&T USA at 99 99 190. Once connected, dial 800 843 4481

Mexico ..... Contact AT&T USA at 001 800 462 628 4240. Once connected, dial 800 843 4481

Miami 1 800 621 8423

Panama..... Contact AT&T USA at 00 800 001 0109. Once connected, dial 800 843 4481

Paraguay ... 001 916 377 0114

Peru 001 916 377 0114

Uruguay..... 001 916 377 0114

Venezuela... Contact AT&T USA at 0 800 2255 288. Once connected, dial 800 843 4481